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THE IRON AGE

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THE IRON AGE

September 30, 1937

ESTABLISHED 1855

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Salesman Knudsen

OUT of Detroit last week came a bit of news that is of interest to all of us who have been following the unsettled course of employer-employee relations in this country.

This is contained in the text of a resolution issued by the executive committee of the Automobile Workers' Union in answer to William S. Knudsen's demand for assurance against the "wildcat" strikes which have so frequently interrupted General Motors' operations since the signing of the agreement with the CIO union.

The resolution referred to read as follows:

"The Union agrees that it is the responsibility of the Management to maintain discipline and efficiency in its shops, and the right of the employer to hire, discipline and discharge employees for cause is expressly recognized, subject to the right of appeal through the Grievance Procedure.

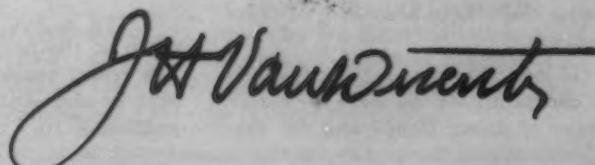
"The Union recognizes and agrees that unauthorized strikes, stoppages of work, and deliberate reduction in rate of production below standards established according to Section C of the agreement, before all the steps set forth in the Grievance Procedure have been complied with, are indefensible and for a violation of this provision by the Union, its officials or members, the Company will discharge or otherwise discipline the employee or employees known to be or found guilty thereof, and the Union shall take effective disciplinary action against the member or members of the Union responsible therefor.

"Noncompliance on the part of the Union with the above provisions shall be deemed a breach of the agreement and a just cause for immediate suspension or cancellation thereof by the Company."

The employer who signs a CIO contract, either from free will or through compulsion, usually does so in hope and fear. He hopes that the arrangement will work out, through enlightened leadership on both sides, to the satisfaction of both parties. He fears, however, that unless such exceptional leadership may develop, mass organization, "feeling its oats," may attempt to curtail those functions of management which are necessary for the preservation of production efficiency. He also fears that spontaneous and unauthorized strikes, as in the case of the motor industry, may break out at any time in spite of the written contract.

The UAW resolution sets a precedent as a recognition of management's rights and labor's obligations in these matters. It also provides a positive prevention for "wildcat" strikes, either of the "sit-down" or any other variety.

Credit is due to Homer Martin and his executive board for accepting this enlightened viewpoint and even more credit, we think, is due Mr. Knudsen, for "selling" them the idea.





E. J. KULAS

Industry Has Been Made

By E. J. KULAS

President *Otis Steel Co., Cleveland*



INDUSTRY, it seems, has now been promoted to the post of whipping boy in national politics. Once, within the memory of some of us who do not consider ourselves old, it was railroads. Then it was oil which furnished the "robber barons." Much more recently, if my memory is not playing tricks, we heard a lot about the money changers. But now it is industry. Industry must be regulated. Industry must not be allowed to make profits and hold any part of them for a rainy day. By taking the money away from industry we are going to make everybody happy.

Quite evidently there must be something wrong about this industrial system which we have developed in this country. They tell us down on the street corners, as well as in some higher places, that it has been making the rich richer and the poor poorer. That may make you wonder where all the low priced automobiles and radios and other products of industry have been going. The rich must be getting pretty well stocked up, because there have been a lot of them sold.

If it is true that industry, which is constantly on the alert for better ways of doing things and for ma-

chines which extend the work of men's hands so that greater production can be obtained, is adding to the wealth of those who have and depriving those who have not, then we will all agree that there is something wrong.

But is that true? Or are those who are so busy in their efforts to promote dissatisfaction and unrest actuated by motives which are sinister or just plain selfish rather than by the sympathy they pretend for the worker?

There are some statistics which bear on the question which I have not seen generally quoted. Unfortunately statisticians, like golf players, do not always follow through. They have an irritating way of taking a different point of approach for each study, so that figures for one group of years are not on a comparable basis with those for another. Still there are comparable figures to cast considerable light on the question, if one really wants the truth.

More of National Income Goes to Labor

There is, for instance, a breakdown of the national income for a few recent years, made by the Federal Department of Commerce and published in that department's

Statistical Abstract. This throws an unexpected light on the depression years. It gives the total national income for 1929 as \$78,632,000,000. That total is broken down into four subdivisions, salary and wages, dividends and interest, rents and royalties and "entrepreneurial withdrawals," which I assume means management and promotional profits. The last three, which are the income of ownership, totaled \$27,145,000,000, while wages and salaries, the income of employees, totaled \$50,487,000,000. In percentages the share of employees was 65.5 and that of ownership 34.5.

For the year of 1935, after five full years of depression, the total national income had dropped to \$53,578,000,000. That part which went to ownership amounted to \$17,530,000,000, while the share going to employees in wages and salaries was \$36,048,000,000. Quite surprisingly the share paid to employees, notwithstanding the widespread unemployment and wage cuts, had risen to 67.3 per cent of the whole while the share going to ownership had dropped to 32.7 per cent.

The years covered by this rather startling change were depression years, when it might be argued

Whipping Boy of National Politics

that almost anything could be expected. It is interesting to note, therefore, that the trend of changing ratio between ownership and employees was not different from that of preceding years. The Department of Commerce only commenced its breakdown of national income with 1929, so figures from previous years are not obtainable from the same source. But Wilford I. King, recognized as an authority, in his book on "The National Income and Its Purchasing Power," gives figures for a number of years up to and including 1928, which show that the share of the employees has been steadily increasing for some years.

In 1914, according to Mr. King, owners received 48.06 per cent of the national income and employees 51.94 per cent. By 1920 the share of the owners had dropped to 46.32 per cent and that of the employees had risen to 53.68 per cent, while in 1928 the owners got but 42.83 per cent and the employees 57.17 per cent. The two groupings of figures are not on the same basis and neither percentages nor dollar totals agree. Their significance lies in the fact that they agree exactly on the trend of the division between owners and employees.

Mechanical Production Has Not Reduced Labor's Share in Output

Years for which these two sets of figures with their identical trends apply were years which saw a great development of the kind for which American industry is criticised by superficial critics—the development of mechanical aids to production. The record of machinery used is found in the record of power consumed in manufacturing. Figures of the Census Bureau give the power consumption in 1914 as 22,290,899 hp. For 1919 the figure was 29,327,669 and for 1929 it was 42,931,061. Power consumption, which means mechanical development, almost doubled in the 15 years from 1914 to 1929.

Those were the same years in which the share of the national income going to employees increased from 51.94 per cent to 57.17 per cent and the share going to ownership decreased from 48.06 per cent to 42.83.

In those same years the dollar total paid in wages to industrial workers, this time not including salaries, went from \$12,396,000,000 in 1914 to \$32,235,000,000 in 1928, according to Mr. King's statistics. A little less than double the machinery, as measured by the consumption of horsepower, produced considerably more than two and a half times the wages for workers, while producing a smaller proportionate dollar volume and a lowered share of total income for the owners.

One specific illustration of what has been happening is furnished by the steel industry. Figures gathered by the American Iron and Steel Institute show that in 1918 payrolls took 34c. out of each dollar of gross sales. In 1929 the figure was 37c. and in the depression years of 1930 to 1935 it was 43c. Since wage rates and numbers employed have risen faster than sales prices in the present recovery, the payroll share of the sales dollar would be still higher now.

Employment in Some Industries Greater Than Ever Before

Definite figures on the numbers of persons employed in industry are not as reliable as figures on wages and incomes. There has always

Mr. Kulas Says:

ARE those who are so busy in their efforts to promote dissatisfaction and unrest actuated by motives which are sinister or just plain selfish rather than by the sympathy they pretend for the worker?

* * *

MANY of those who discuss industrial problems *** insist on looking at industry through the wrong end of the telescope. *** When we look at manufacturing industry honestly we find that it is a component part of our whole structure of modern life *** having its effect on every other phase of life.

* * *

IT does not yet seem to have dawned on many labor specialists *** that the limit of wages which can be paid

for a particular industrial operation at a given time is not set by the selfishness of a cruel employer but by the level to which cost of production can be raised without checking consumption.

* * *

IT is a happy fact that the mechanical development of industrial processes has benefited the world at large and at the same time the worker in industry.

* * *

WHETHER we yet recognize it, a more or less permanent pattern for American industry has been emerging *** , a pattern based on the intelligent use of power by the industrial worker who will profit in proportion to the important service he renders the public.

been a fuzzy character about employment statistics and no Government, least of all the one we have now, seems to want to know how many are employed and how many are idle. We do know that employment in some specific industries, of which the steel business is one, is greater than ever in history, and from general figures of industrial production we can only assume that the same is true through pretty well all industry.

But actual employment of men and women in the industrial arts does not and never has included anywhere near all the men and women employed because of industry. As an illustration we have seen the development within recent years of a mighty rayon industry, one of the marked effects of which has been to replace in our domestic markets a vast quantity of imported silks with a material of domestic manufacture. I would not know how many thousands of men and women have been given direct employment by this thriving new industry. I do know, however, that those who go in and out of the rayon mills are but part of those to whom the industry has given employment. The natural materials have to be raised and handled and shipped and the finished product swells the distribution task clear down to the retail counter over which it is passed to the ultimate consumer, often far from any industrial producing center.

Manufacturing Industry Touches Every Phase of National Life

Many of those who discuss industrial problems, including, I fear, some who ought to and possibly do know better, insist on looking at industry through the wrong end of the telescope. They set manufacturing apart as an activity by itself which should be dealt with separately from the rest of our concerns when actually every single element of our food, clothing and shelter, every article of our consumption or use has to pass through a manufacturing stage before it comes to us. We have lost our taste for raw meat as we have become civilized and it takes a billion dollar packing business to prepare it for us. Our grains must be milled, our vegetables at least cleaned, graded and shipped, our wool carded and our cotton woven.

When we look at the manufacturing industry honestly we find that it is a component part of our

whole structure of modern life, affected by every condition which affects any other of our many activities and in turn having its effect on every other phase of life. Prairie Gulch, if there is any such town, out on the edge of things, may feel that it has little interest in industrial problems or industrial advancement. But if the modern motor car factory with its thousands of employees producing millions of dollars worth of merchandise as well as plenty of industrial headaches, had not been evolved in the development of industrial science, the two or three filling stations and the repair garage which are so important in the life of Prairie Gulch would not exist. If the packers and the canners and the textile mills and the makers of household gadgets did not provide for the needs of all, Prairie Gulch would not even exist.

Mechanization Has Reduced Cost and Prices of Steel

It has taken some of the owners of industry a long time to realize the social significance of their activity and to recognize that a payroll dollar, before it gets through rolling, will have created many market dollars to keep their machines turning. Similarly it does not yet seem to have dawned on many labor specialists, least of all those who specialize in labor for political purposes, that the limit of wages which can be paid for a particular industrial operation at a given time is not set by the selfishness of a cruel employer but by the level to which cost of production can be raised without checking consumption.

What is known as mechanization in industry, by which is meant the introduction of mechanical devices which so extend the work of men's hands that the production per man is largely increased, has been regarded as more or less of a private quarrel between owner and employee. But it has its public side which is fully as important. New devices which have increased production so greatly have, of course, held down prices and so spurred sales. They also have made for greater uniformity in quality which has had a great effect in the creating of entirely new markets.

One of the best illustrations of this is found in the steel business. Sheet steel today costs about half as much as it did before the intro-

duction of the continuous rolling mill. In addition the continuous mills, because they roll a large quantity of sheets in such a short time that reheating is not necessary, have produced much greater uniformity of quality. As a consequence sheet steel can now be used for many articles for which it was not suitable before.

Steel may seem to be a commodity interesting principally to territories like Ohio and western Pennsylvania, where the bulk of the production is had and where the question of how many men are employed and at what wage is of prime importance. But every little town and country crossroads settlement is as vitally interested as are we in the steel country. Some of the new markets created have been the mass production of radios and refrigerators which we never had before, the production of better and cheaper automobiles, even of better and cheaper tin cans. That is the nationally public side of what is sometimes represented as a purely industrial problem.

If we had to look at it in such a narrow way it would be no more than fair to say that the interest of the man who actually works in industry is only part and not the larger part of the interest involved in industrial advancement. If the men who actually work in industrial production were no better off than their fathers, who worked exclusively with their hands, we could still say that our industrial development has been entirely justified because of its great contribution to the development of the whole country and its people.

Real Wages Have Moved Up Through Mechanical Development

Fortunately we do not have to make such a choice between the interests of the industrial worker and the rest of the country. Statistics show conclusively that as mechanical development in American industry has progressed there have been three movements which have kept steady pace with it. Wages have gone up, hours of labor and the requirements for great physical exertion have gone down and so also have the prices at which the products of industry can be purchased.

That wages have moved up while prices were moving down is amply shown by a cost of living study by the National Industrial Conference

Board, which shows that an automobile which would have cost the wage worker 3081.7 hours of labor in 1914 could be earned in 859 hours in 1936; that a pair of work shoes which would have cost him 9.3 hours of work in 1914 cost but 3.4 hours in 1936 or a hat which cost 11.5 hours of his time in 1914 could be had by working 3.4 hours in 1936. These are but a few of the examples cited in the study.

It is a happy fact that the mechanical development in industrial processes has benefited the world at large and at the same time the worker in industry. I think this is because most of our mechanical development has been along semi-

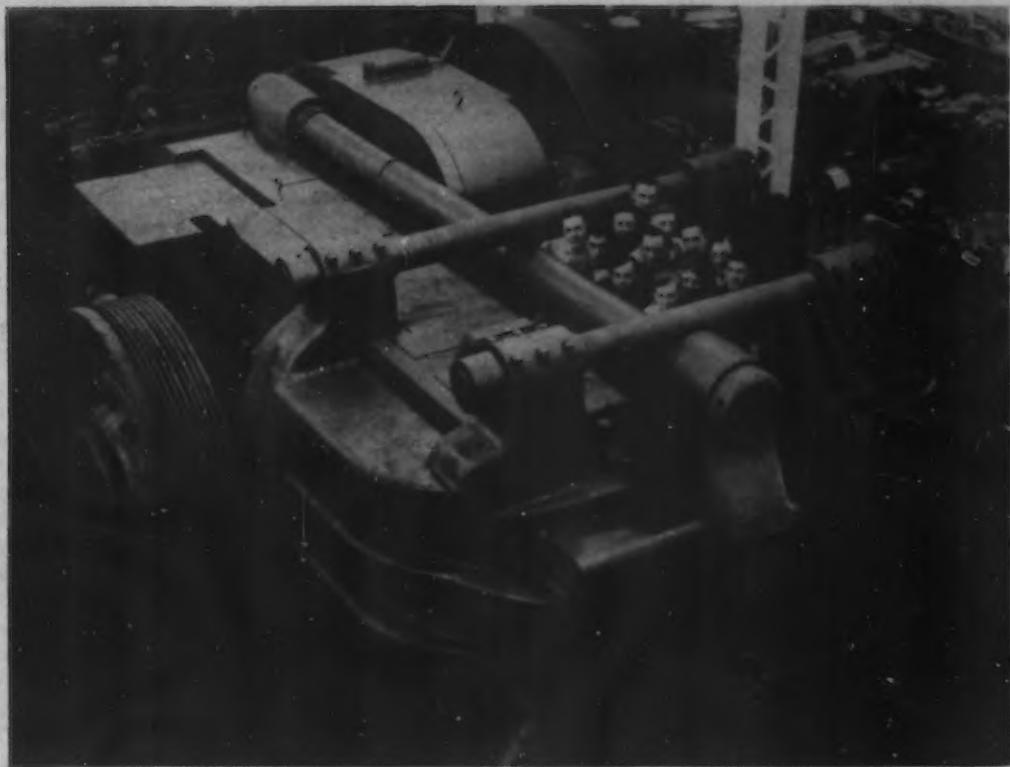
automatic rather than fully automatic lines. Completely automatic machinery pre-supposes very large production of completely identical articles. On no other basis could it be considered economically sound. But in spite of all the talk about our genius for mass production the American people will not put their buying into a groove. More than any other people on earth they are imbued with that restless spirit which demands constant improvement. They are always ready to throw away or trade in this year's gadget if next year's design has greater beauty, more utility or promises better service.

Our semi-automatic machinery,

where power furnishes the brute strength and man furnishes the judgment and skill, retains the flexibility which permits of the constant change the American market demands. Basic principles of manufacture may remain the same but the individuality of each design is accomplished.

I suspect that whether we yet recognize it a more or less permanent pattern for American industry has been emerging during these years of development, a pattern based on the intelligent use of power by the industrial worker who will profit in proportion to the important service he renders the public.

A Giant Among Forging Machines



THE National Machinery Co., Tiffin, Ohio, has just shipped two high-duty forging machines which are much larger than any such machines heretofore built. They are intended for upsetting operations on tubing, and will handle sizes as large as 13 to 14 in. diameter.

These machines follow the standard design of National forging machines as manufactured by this company, and have a massive underslung bed frame; suspended

over-arm type heading and gripping slides; longitudinal and cross tie bars for added rigidity, and an air-operated friction clutch. Some idea of the size of the machine can be gained by calling attention to the fact that the bed frame is made in two sections, each of which is as large as can be shipped. The machine is assembled on location, and the bed is held together by enormous tie bars shrunk in place. A further idea of its size can be gained by mentioning that the stroke of the heading ram is 30 in., and the ma-

chine uses gripping dies up to 52 in. long. The weight of this machine is 500,000 lb., and it required a 150-hp. motor to drive it.

One view showing the machine finished in the shop gives some idea of its enormous size. The other view shows that a dozen men can stand in the die box space.

Forging machines have become a highly important master tool of industry, and with their broadened range and capacity their serviceability becomes more extended.

Molding of Chemical Kettles

LARGE kettle castings are molded many different ways. This to a greater extent than is realized is the cause of failure or success in their production.

Seldom is enough thought given to the reactions that take place when the mold is filled and the metal is still in the molten state—and sometimes after it has solidified.

If the casting comes out of the mold with a smooth surface, true to pattern, and checks up with the desired analysis, most foundrymen are satisfied that they have done a good job. However, it has been demonstrated that a more careful study of mold conditions, mold materials, and molding methods, improve the quality and prolong the life of the kettle very materially.

By PAUL R. RAMP

• • •

The dry sand mold is used by some, using a sweep to shape the mold. The result is an irregularly rammed surface that produces numerous different thicknesses of metal throughout the entire casting. Though small, these variations are numerous and set up minor internal strains that may be scoffed at by many veterans but nevertheless they shorten the life of a casting subjected to hard service.

The ramming of these dry sand molds in conjunction with the sweep method cannot be uniform, and many places that are rammed too hard create spots in the mold that cause undesirable agitation even to the extent of producing a

scab or a cut on the surface of the mold. Such practice also produces a metal with sand particles mixed in it which is readily attacked by the chemicals and heat. These sand particles may not be discovered on the surface, but they are there and eventually show up in service with some very expensive results.

These are but two of the important reasons why a dry sand "swept-up" kettle mold is not the correct mold to produce a high grade casting.

Making kettle molds by using cast iron prickered brick with perforations in the brick for vents and covering the brick with a coat of loam would appear to be a good method, especially from an economic point of view, if it were not for the rapid cooling of the metal

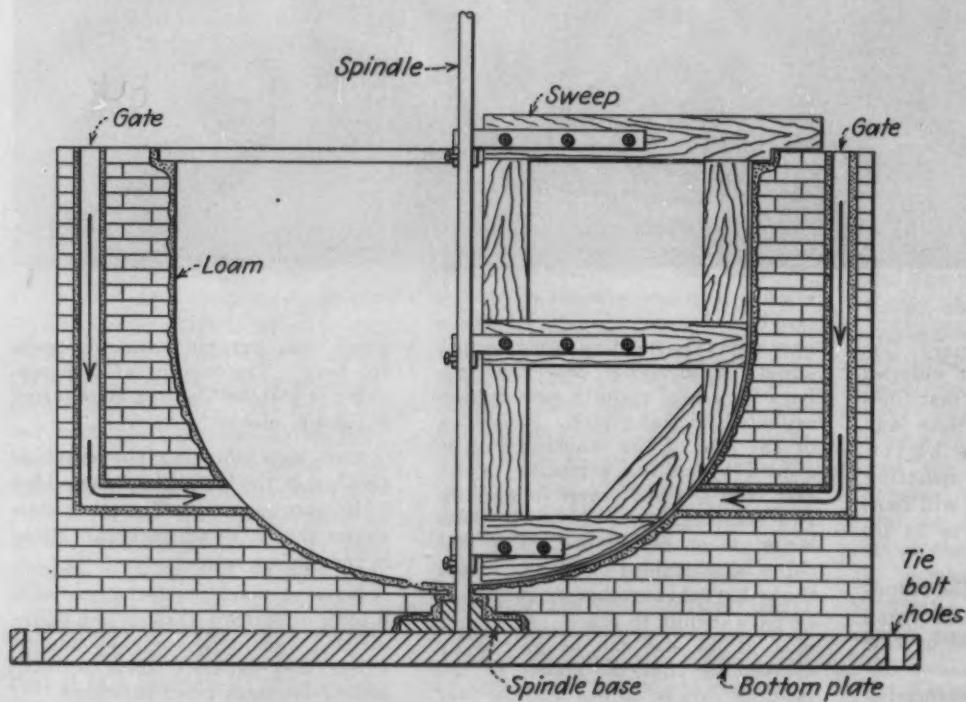


FIG. 1—Cross section of drag mold showing sweep and spindle.

caused by the absorption of the heat by the metal brick. This has a semi-chilling effect on the casting, causing the development of small checks or cracks which eventually break down the metal structure and shorten the life of the kettle.

The method of using the same mold surface several times, by carefully lifting the casting out of the mold is cheap but very unreliable and always results in dirty metal even though the surface of the casting may appear good.

The gating of these kettle molds is many times in error. Gating from the top with pencil gates is almost standard practice and would be correct if the plan did not deposit the first iron that enters the mold—the "wash iron"—on the bottom of the casting and allow it to remain there at the very point where the best metal is required.

The plan of molding the kettle bottom up because the bottom is twice as heavy as the side—the thought being, "it is easier to feed the heavy bottom" is a mistake, as it will not produce a good casting.

Method of Gating and Pouring Important

The method of gating and pouring highly alloyed kettle or pot castings has a great influence on their life in service.

When molten metal comes in contact with the surface of a mold an agitation is created that affects the quality of the metal. This agitation may be hardly noticeable but it can have a damaging effect on the quality of highly alloyed iron. It is advisable, therefore, to direct the flow of the metal in a manner that will eliminate this agitation before solidification takes place. The first metal that covers a vital portion of a mold must not be allowed to remain at that point, but after it has served its purpose as a preheater and cleanser, it must be pushed along to a less important location in the mold.

This is more important in the production of alloy castings than in castings without alloys because metals containing a high percentage of alloys are more sensitive to mold conditions than ordinary iron.

The material used to make these molds reflects itself in the life of the casting. A material that produces a smooth casting does not always produce a sound casting, or a casting that will stand up in

service when subjected to the action of chemicals or heat, even though it may contain the specified percentage of alloys. It has been found that in the production of high grade chemical castings some of the molding methods and molding materials used years ago are of decided value today.

With this in mind we are describing the method of molding a

This completes the work of making the drag mold.

The next operation is to reduce the size of the sweep so it will form the inside dimension of the kettle. This is accomplished by removing a thickness strip or false edge that has been attached to the sweep, to form the greater outside diameter of the mold. The method used to secure the desired thickness of the kettle is as follows:

Twenty strips made of wood that conform to the shape of the outside of the kettle on one side, and to the inside on the other edge, are placed in the drag mold equally spaced. The spaces between these thickness strips are filled with black sand, "which is properly tempered molding sand," the sweep is again used to sweep the surface of the black sand to the required size and shape. This done, the sweep and spindle are removed and the mold is ready for the crown plate. The crown plate is in reality the lifting plate that carries the part of the mold which forms the inside of the kettle.

kettle casting, which may appear as kindergarten work to many, but it is what we have found to be the most reliable method of molding to produce a high grade alloy casting that will stand up in service.

Fig. 1 is a cross section of the drag part of a 12-ton kettle mold, with the sweep in position, the brick work completed, and the loam applied to the brick swept to the desired shape to form the outside of the casting.

The gates leading from the joint to the bottom of the mold shown are formed by the use of dry sand cores made in lengths that enable the molder to build up the gate at the same time the bricks are being laid.

Fig. 2 is a cross section of a crown plate just completed and ready for drying. The crown plate proper consists of a heavy plate with long prickers or carrying-rods cast in it. The carrying-rods shown in Fig. 2 are used to carry the brick employed in making this part of the mold. Numerous holes marked "vents" are also cast in the plate in order to provide an escape for the gas generated when the mold is filled with metal.

The bricks are held in place by means of small metal wedges driv-

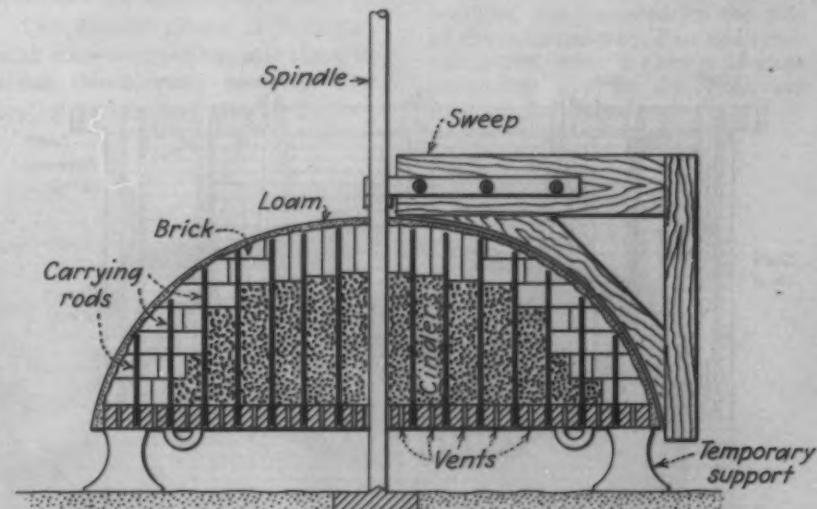


FIG. 2—Cross section of completed crown plate with sweep in position.

Gas Hot Tubes for Burning Porcelain Enamel



THE acceptance of porcelain enamel as the finish deluxe for iron and steel has received an added impetus through the fairly recent introduction of the flexible gas radiant or hot tube type of furnace which has materially reduced the cost of this finish. As the basic principle is a self-contained heating unit, consisting of a tube heated from the inside by a gas burner, almost any type of furnace can be easily equipped with this method of heating. Furthermore practically all kinds of furnaces including the box type, hairpin type or the long continuous type, can be converted to this new method of heating quickly and easily.

All that is necessary is to remove the existing gas burners or

By J. B. NEALEY
American Gas Association

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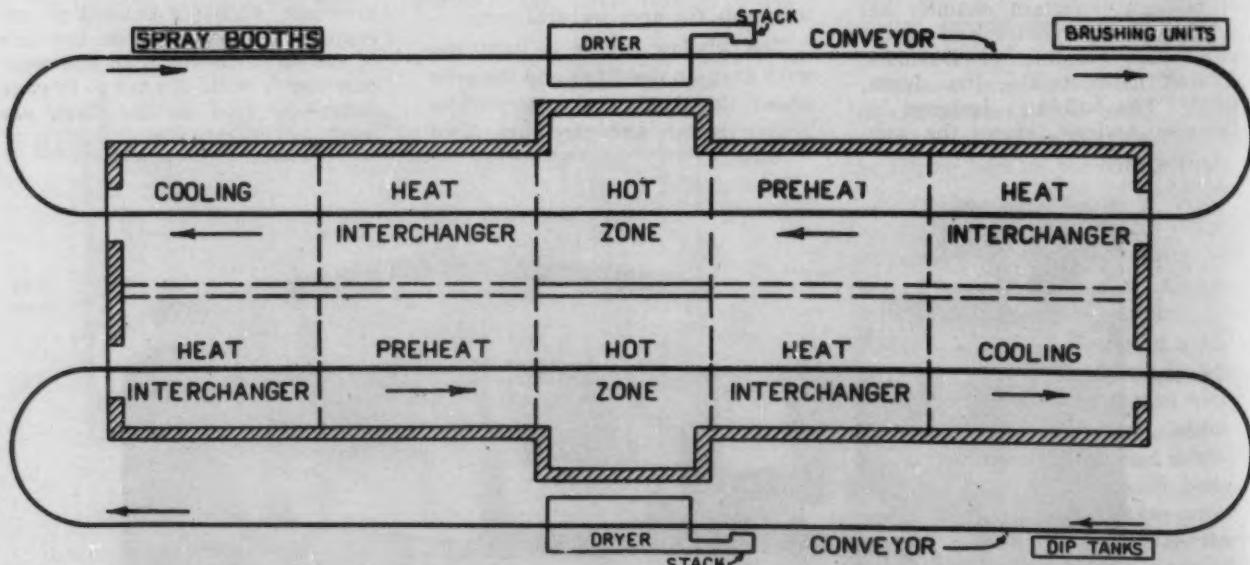
heating system of refractory muffle and install the gas radiant tubes. These hot tubes are of alloy steel and are applicable with temperatures up to 1800 deg. F. in practically any atmosphere.

The gas radiant tubes are of varying lengths and diameters and lie within the furnace with one or both ends protruding through the furnace wall. A gas burner fires into one end and the hot products of combustion, after passing through the tubes, are discharged to the atmosphere and outside the furnace. In other words the hot tubes act as muffles so that no

products of combustion can enter the furnace.

Flexibility in operation is one of the advantages of the versatile gas hot tube. A furnace so equipped can be closed down at will and with impunity and in addition it has quick recovery. The saving in cost of fuel when a porcelain enameling furnace can be shut down nights and weekends is very material. On such an operating schedule it should be in excess of 25 per cent. In addition, maintenance of the muffle, plus the rapid deterioration of the refractory hearth due to the severe fluxing action of enamel from the ware dropping on it, are eliminated.

Naturally the first vitreous enamel furnaces employed in this country were of the batch type. They had muffles and were heated



PLAN view of continuous gas-fired porcelain enameling furnace showing layout of spray booths, dryers and brushing units.



FRONT end of porcelain enameling or vitrifying furnace and drying oven, showing conveyors and dipping tank.

with coal burned in separate fire boxes. Discoloration of the ware by the sulphur in the coal necessitated its protection by muffle. Furnaces heated with oil or gas made their appearance at the turn of the century but the need for the muffle remained. Semi-muffle and then intermittent furnaces without muffle were introduced with little improvement in atmosphere control or otherwise. This intermittent type was operated by firing the furnace until the entire brick shell was heated, when the gas burners were turned off, the atmosphere purged and the ware put in and burned by the residual heat given off by the brick.

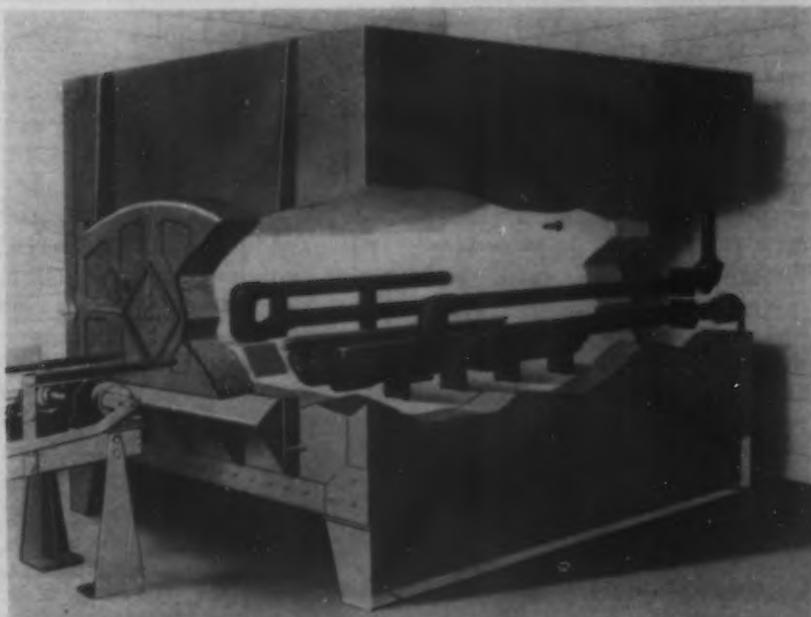
The full muffle furnace finally became standard and the first real improvement in muffles came with the invention of the high temperature refractories, silica carbide and fused alumina. These soon replaced fire clay in muffle construction, because of their greater mechanical strength, greater thermal conductivity and ability to withstand higher temperatures. In other words, thinner sections could be used in the muffle wall which increased the heat transfer and consequently the productive capacity of the furnace.

With mass production came the

semi-continuous and continuous enameling furnaces, the circular and straight through types and finally the hairpin furnace. Economical and flexible gas became an extensively used fuel. Hearth conveyors were replaced by the chain suspension type of conveyor by which the work is hung on tools

(inside the furnace) suspended from moving chains, above and outside the furnace with the shanks of the tools traveling through a slot in the rear of the furnace.

One of the best designs for the straight through chain suspension type uses the counter-flow principle of heating which permits the



CUT-AWAY view of furnace showing location of tubes, together with gas burner and eductor.

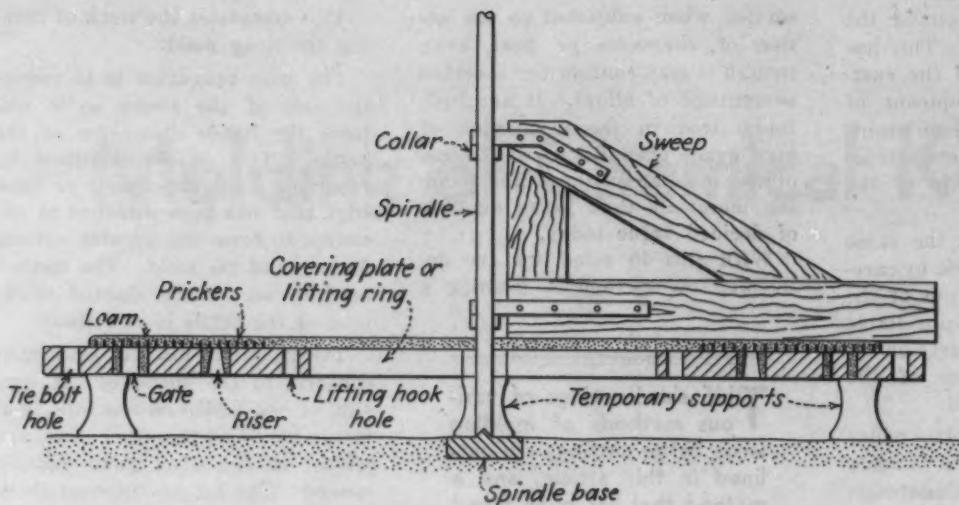


FIG. 3—Sketch showing lifting ring in the making.

en between the bricks and the carrying-rods. When these bricks have been properly secured a coat of loam is applied and the sweep is used to shape the inside bottom of the kettle. While building the brick, the space between the brick and the heavy metal plate is filled with cinders, which provide for prompt escape for the gas. After the mold has been formed on the crown plate as described, the sweep and spindle are removed, the mold given a coat of blacking and placed in an oven to dry.

After the crown plate is dry enough to handle without the loam falling off it is removed from the oven, turned over and placed in the bottom of the drag mold, allowing it to rest upon the thickness strips and the black sand. If it fits properly the next procedure is to build up the balance of the inside mold

of the kettle with brick and loam until the level of the joint of the mold is reached. This is done in the usual manner of loam molding with a pattern. The black sand and the thickness strips represent the pattern.

The next operation is to provide a lifting ring or cope, which ring is used to carry the inside part of the mold. Fig. 3 is a cross section of the lifting ring in the making. Prickers are provided to carry the loam on the surface that will come in contact with the drag mold and form the top of the flange. In this case the loam is used very dry and rammed on the plate and struck off level with the sweep. The sweep is shown in Fig. 3. The lifting ring mold is finished and dried, then turned over and placed upon the molds and properly secured to the center core by heavy

hooks that fit into loops cast in the crown plates for that purpose.

Fig. 4, a cross section of the kettle mold ready for the cope to be lifted off, shows the result of all the work previously described. The mold is built upon a heavy bottom plate that is used as a binder in conjunction with the lifting ring when the mold is being poured.

The position of the crown plate, part of the mold, is shown with the continuation of the brick wall that has been built above it.

One half of the cross section shows the thickness strips and the other half the black-sand thickness.

The lifting hooks that extend through the lifting ring and connect with the loops in the crown plate carry the entire weight of the inside core of the mold.

The stool posts are used to help resist the lifting pressure that is exerted against the core when the mold is full of molten metal.

The next procedure is to lift out the center part of the mold. This is done by attaching heavy slings to the lifting lugs on the lifting ring.

After the cope has been lifted off the black sand and thickness strips are removed and the surfaces of both drag molds are finished, blacked, and thoroughly dried.

Fig. 5 is a cross section of a 12-ton chemical kettle mold ready for pouring. This mold is poured with two ladles in order to secure a better distribution of the metal and to better direct the flow of same. Note the two pouring basins and the gates leading from these basins to the bottom of the mold. This plan of gating forces the first metal to rise

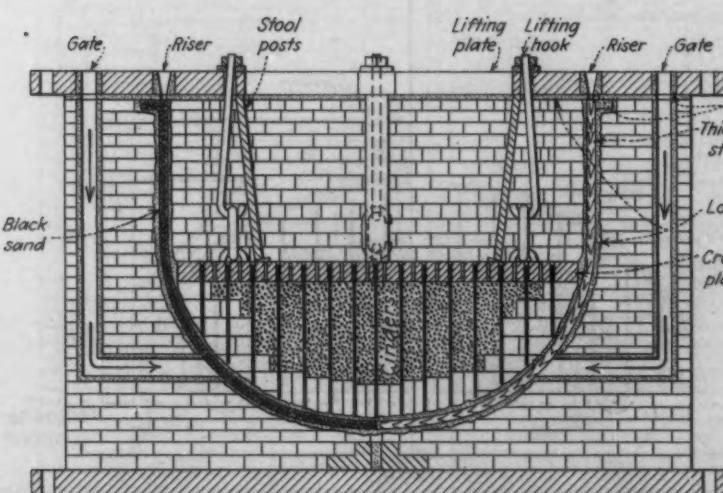


FIG. 4—Cross section of kettle mold ready for lifting off the cope.

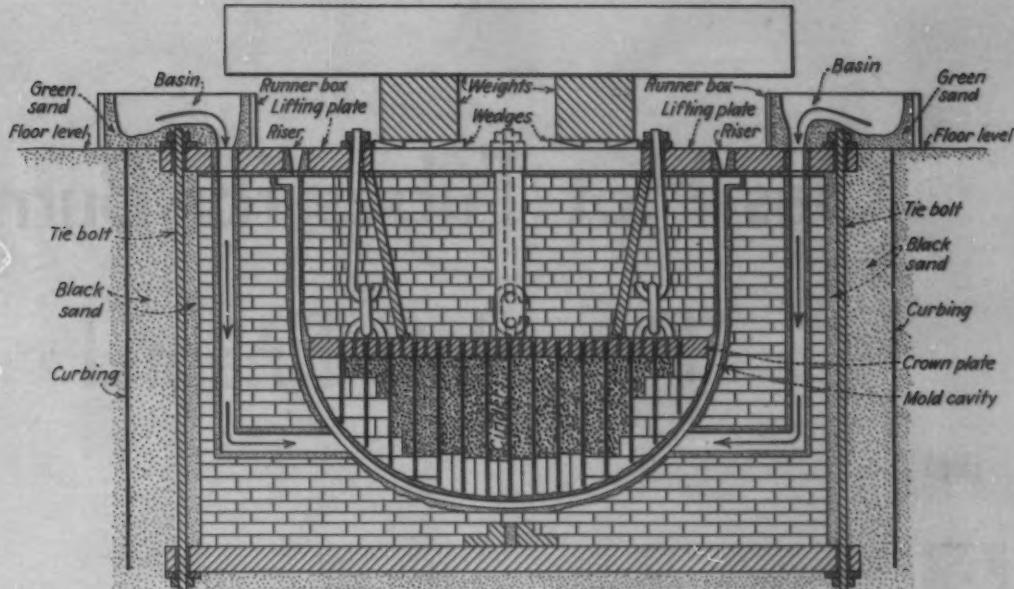


FIG. 5—Twelve-ton chemical kettle mold ready for pouring.

to the top of the mold after it has flowed over the bottom surface, which heats up the bottom and permits the final metal to lie quietly without any agitation at this point. The tie-bolts are shown that extend through the lifting ring and the bottom plate and bind the mold together.

The mold is made in a pit to make pouring easy and is held together by ramming sand firmly between the

outside of the brick walls and the usual steel curbing. Additional weights are used as shown; they extend over the mold far enough to permit them being supported on the foundry floor. To prevent their weight from crushing the mold, after the weights have been placed with a 2-in. space between their lower surface and the top of the lifting ring, metal wedges are driven between the weights and the

lifting ring. This is sufficient weight to hold the cope down without any danger of crushing the mold.

The risers or flow-offs are shown extending through the lifting ring.

The mold made of loam in this manner assures a mold with a uniform hardness of surface, that produces a casting of uniform thickness and a mold surface which will not cause any agitation of the metal.

Porcelain Enamel Used For Exterior of Office Building

THE beauty and adaptability of modern porcelain enamels are typified in this photograph of the new office building of Davidson Enamel Products Co., Inc., Lima, Ohio. The building, designed by Douglas Andrew, shows the wide

variety of finishes and colors available for architectural uses.

The window course is light tan with snap-on moldings and the area about the doorway is ivory. The coping is tan and chocolate. Two

decorative plaques, showing characteristic views of enameling operations, are mounted on the side of the entrance-way. Pan and semi-pan parts, with Armco 16-gage enameling iron as the base, are used on the exterior.



Gas Hot Tubes for Burning Porcelain Enamel



THE acceptance of porcelain enamel as the finish deluxe for iron and steel has received an added impetus through the fairly recent introduction of the flexible gas radiant or hot tube type of furnace which has materially reduced the cost of this finish. As the basic principle is a self-contained heating unit, consisting of a tube heated from the inside by a gas burner, almost any type of furnace can be easily equipped with this method of heating. Furthermore practically all kinds of furnaces including the box type, hairpin type or the long continuous type, can be converted to this new method of heating quickly and easily.

All that is necessary is to remove the existing gas burners or

By J. B. NEALEY
American Gas Association

• • •

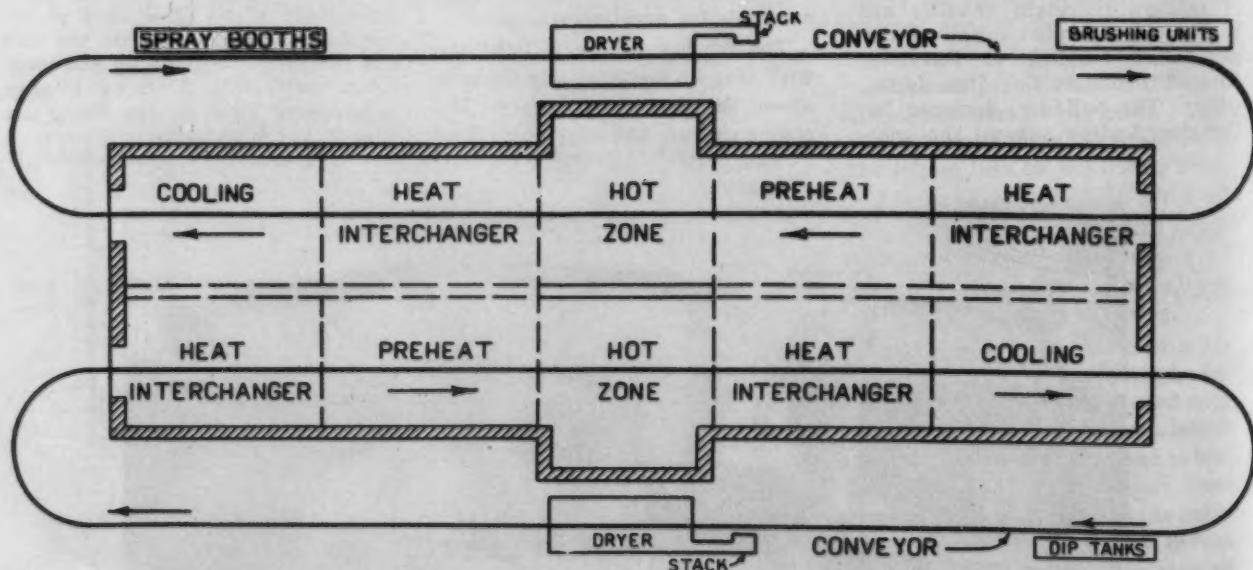
heating system of refractory muffle and install the gas radiant tubes. These hot tubes are of alloy steel and are applicable with temperatures up to 1800 deg. F. in practically any atmosphere.

The gas radiant tubes are of varying lengths and diameters and lie within the furnace with one or both ends protruding through the furnace wall. A gas burner fires into one end and the hot products of combustion, after passing through the tubes, are discharged to the atmosphere and outside the furnace. In other words the hot tubes act as muffles so that no

products of combustion can enter the furnace.

Flexibility in operation is one of the advantages of the versatile gas hot tube. A furnace so equipped can be closed down at will and with impunity and in addition it has quick recovery. The saving in cost of fuel when a porcelain enameling furnace can be shut down nights and weekends is very material. On such an operating schedule it should be in excess of 25 per cent. In addition, maintenance of the muffle, plus the rapid deterioration of the refractory hearth due to the severe fluxing action of enamel from the ware dropping on it, are eliminated.

Naturally the first vitreous enamel furnaces employed in this country were of the batch type. They had muffles and were heated



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FRONT end of porcelain enameling or vitrifying furnaces and drying oven, showing conveyors and dipping tank.

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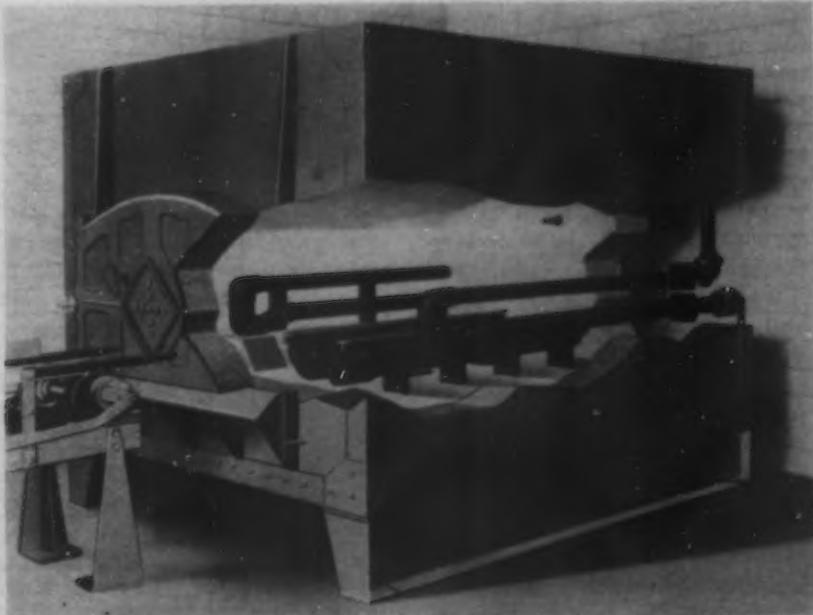
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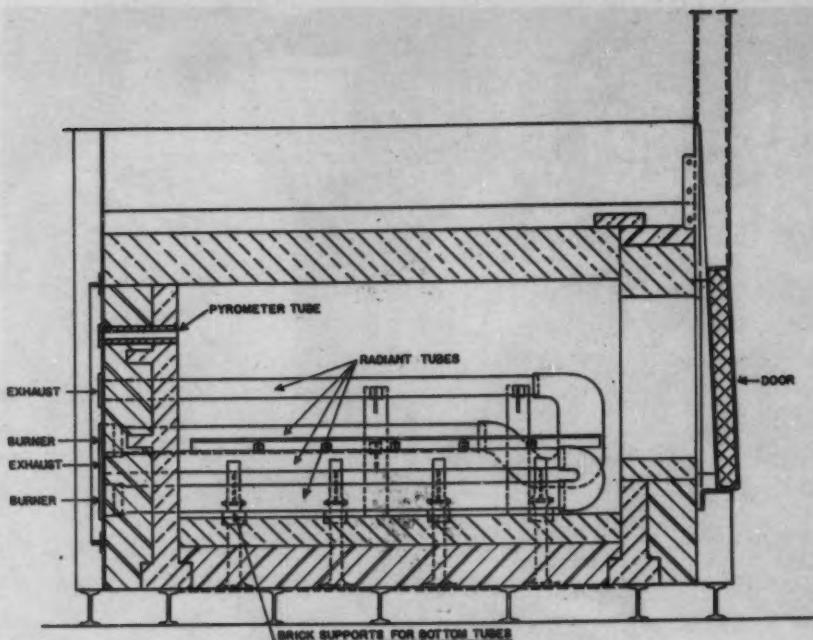
semi-continuous and continuous enameling furnaces, the circular and straight through types and finally the hairpin furnace. Economical and flexible gas became an extensively used fuel. Hearth conveyors were replaced by the chain suspension type of conveyor by which the work is hung on tools

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CUT-AWAY view of furnace showing location of tubes, together with gas burner and eductor.



ELEVATION of radiant tube furnace of recent design, for porcelain enameling.

application and finishing of two coats before removing the ware from the conveyor. The closed loop chain conveyor is so located that the tools pass along parallel slots in the roof. Thus two lines of work are continually passing through the furnace but in opposite directions. The first coat is applied and the work hung on the conveyor at one end and is burned on as it passes through, the second coat is sprayed on as the conveyor makes the turn at the opposite end, and this is burned on in turn as the conveyor makes the return trip through the furnace. The hot zone is in the center of the furnace so that the incoming cold work is pre-heated by the hot outgoing ware at both ends and this is known as the counter-flow principle. The greatest difficulty is atmosphere and temperature control, for a tunnel, open at both ends, is subject to through drafts.

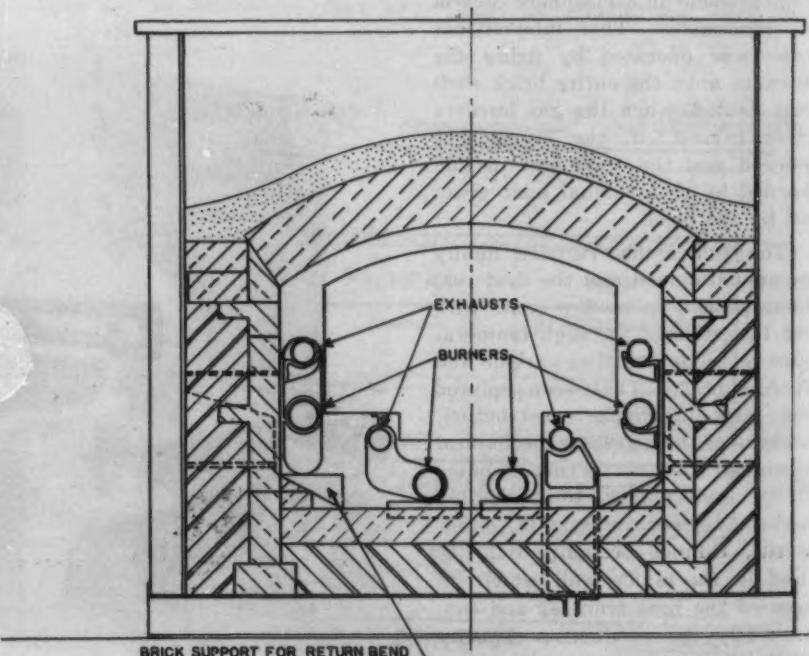
With a view to improving on this, the hairpin type of furnace was designed which is essentially like the one described, but with one end closed and the hot zone placed in that end. The counter-flow principle also holds with this type of furnace. The hot zone is muffed and the hot products of combustion are carried under the hearth of the preheat section so as to augment the heat interchange furnished by the outgoing hot-ware to the incoming cold work. A dis-

tinct improvement in porcelain enameling practice, accomplished with these two types of furnaces, is the slow heating up and cooling which materially betters the ware. A number of variations of the above types have been tried, some with success.

If for any reason this newly developed gas hot tube type of furnace is not employed, the operating costs of all these other various

types of enameling furnaces, just described, can be materially lowered and the maintenance costs practically eliminated by applying gas hot tubes to them. As already stated, all that is necessary to make this conversion is to pull out the muffle and existing burners, or grids and ribbons as the case may be, and install the easy-to-handle gas hot tubes. There is always plenty of space between the ware and furnace walls or floor for this. As each tube is a separate unit in itself, gas burner and all, the correct number can be selected and the hot tubes so spaced as to provide any heat condition required. Furnaces in which are installed hot tubes almost 100 ft. in length, are in use today.

Absolutely even distribution of heat is one of the features of these gas hot tube furnaces. Placing the heat where it is most needed, at the bottom, is another. With the continuous type of furnace the length of the unit and the speed of the conveyor are varied to correctly regulate the preheating, heating, and cooling periods. Automatic temperature controls maintain the desired temperature, regardless of changes in the volume of work going through. To capitate—economical gas hot tubes supply the long needed flexibility, and reduce operating and maintenance costs very materially.



CROSS section of the radiant tube furnace shown in elevation above.

Jovignot's Cupping Test for Sheet Metal

By PAUL BASTIEN

In the first section of this article, which appeared in Sept. 16 issue, Mr. Bastien discussed the structural and operating characteristics of C. Jovignot's fluid pressure machine for testing sheet metal. The advantages of this machine were pointed out and the criticisms which have been directed at it were analyzed. In this, the concluding article, the results of fluid pressure cupping tests are compared with tests made on machines employing a tool as the cupping medium. Mr. Bastien's original article appeared in *Revue de Metallurgie*, Paris, and is reproduced here through the courtesy of *Sheet Metal Industries*, London.

made by Gough and Hankins which are of interest.

With the N.P.L. machine described in the previous article, it is possible to record the pressure-deflection diagram of the spherical segment while a test is in progress. According to the authors, this diagram recorded to the point of fracture ought to provide a useful basis for deciding whether a metal is suitable for cold drawing. The recorded curves have a marked resemblance to the load-extension diagrams recorded in tensile tests.

Gough and Hankins endeavored to define the suitability of a metal for cold drawing from complete cupping diagrams. These tests, applied to a certain number of pressing metals, were not conclusive in all cases, but they have led the authors to believe that such diagrams permit a better choice to be made between the various metals than the knowledge of the ultimate stress alone and the cupping coefficient as given by the fluid-pressure cupping test without recording.

Diagrams of the deformation under tensile stress recorded along and across the metal probably furnish similar information, but it is



GOUGH and Hankins compared the stress at fracture, calculated as indicated in the first part of this article by means of the formula for the strength of a thin spherical shell, with the breaking load for the same metal subjected to a static tensile test. The comparison was made for numerous metals (brass, copper, tin plate, mild steel, aircraft steel, stainless steel, zinc, aluminum and cupro-nickel) and for different thicknesses. In the majority of cases, the ratio of the two break-

ing loads remains very satisfactorily in the neighborhood of unity. (See Table II).

The fluid-pressure cupping test is thus capable of rendering valuable services in regard to the determination of the breaking loads of sheet metal. The test is rapid and does not necessitate any preliminary machining of the test-piece. At the National Physical Laboratory, the method has been found to be particularly useful for determining the tensile strength of very thin metal foils, for which it is generally very difficult to make a correct tensile test. Before terminating this review, there are two points in the investigations

¹Guillary, Bull. Soc. Enc. Ind. Nat. cxxvii, 483-502 (1928).

²Avery, Engineering, cxxviii, 497 (1929).

³Erichsen, Stahl und Eisen, xxxiv, 879 (1914).

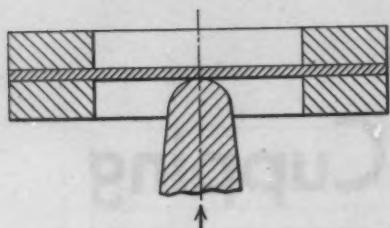


FIG. 8—Form of tool used in Persoz-type tests.

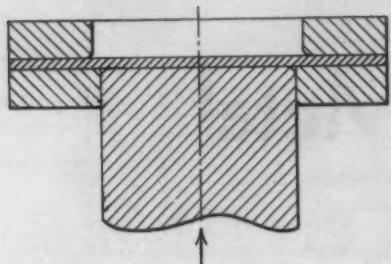


FIG. 9—Form of tool used in A.E.G. tests.

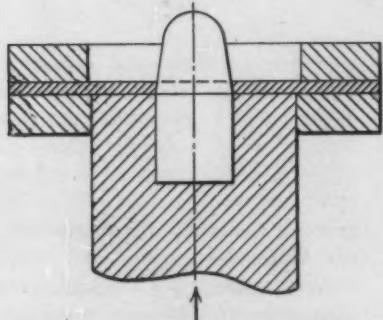
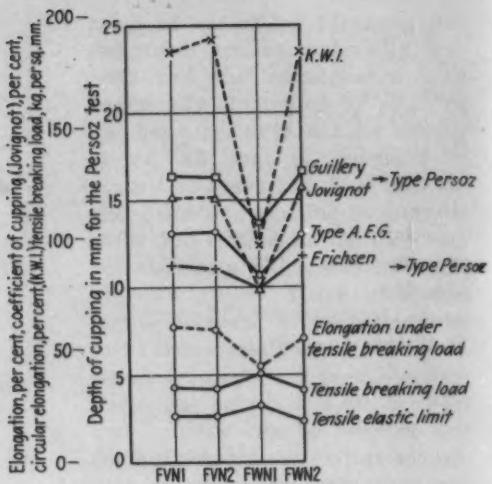
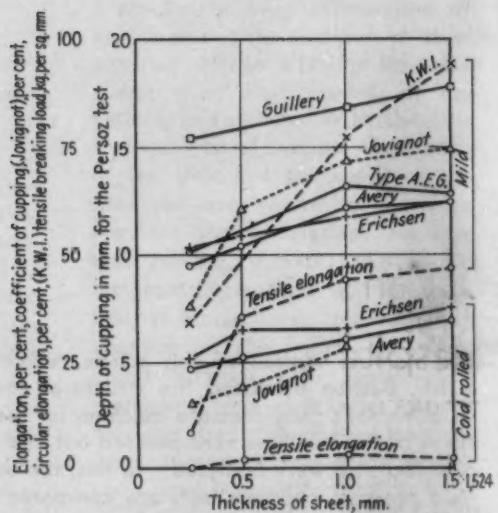


FIG. 10—Form of tool used in K.W.I. tests.

AT RIGHT
FIG. 11—Comparison of cupping tests on mild steel.



AT RIGHT
FIG. 12—Comparison of cupping tests on copper steel.



reasonable to suppose that the cupping diagram can be obtained more easily and rapidly and has in addition the advantage of furnishing in a single test information regarding the directional "surface" properties of the test-piece.

With a view to completing the investigations reviewed in the previous article, Gough and Hankins

made a comparison between the oil-pressure cupping test and the Guillary, Erichsen, Avery, A.E.G. and K.W.I. methods employing a tool.

The Guillary,⁶ Avery⁷ and Erichsen⁸ machines are all of the same type and utilize the method perfected by Persoz as long ago as 1903 (Fig. 8). They employ a tool

having a spherical tip 20 mm. in diameter. These machines merely differ in details concerning the shape and diameter of the clamping dies. The A.E.G. test differs from the preceding methods in the shape of the cupping tool which is cylindrical with a rounded edge (Fig. 9). The K.W.I. method evolved by Siebel and Pomp at the Kaiser-Wilhelm Institute employs a cylindrical tool having a rounded edge similar to the A.E.G. tool, acting on a test-piece with a 12-mm. diameter hole drilled in the centre (Fig. 10).

The comparisons were made from the point of view of ductility by comparing the percentage values of the Jovignot cupping coefficient with the circular elongation of the hole in the K.W.I. test and the deflections in the Erichsen, Guillary and A.E.G. tests. For some metals,

TABLE II.
Relationship Between the Tensile and Jovignot Tests

Metal Tested	Value of the Ratio	R Jovignot Test	
		R Tensile Test	R Tensile Test
Brass	1.03		
Copper	0.88 to 1.08 (according to thickness)		
Tinned iron	0.98 to 1.19 (according to thickness)		
Mild steel	0.96 to 1.03		
Stainless steel	0.86		
Zinc	0.94 to 1 (according to thickness)		
Soft aluminum	0.87 to 0.95 (according to thickness)		
70:30 brass	0.95 to 0.98 (according to thickness)		

the elongation at fracture in the tensile test was also considered.

The curves shown in Figs. 11, 12 and 13 relate to four types of mild steel, copper and soft aluminum, tested for various thicknesses.

It will be noticed that, taken altogether, the different curves have the same shape. It is interesting that the range of the values found—that is to say, the sensitivity—is the greatest in the K.W.I. tests and, to a lesser degree, also in the Jovignot test—a point in favor of these two methods.

In conclusion, the investigations which have just been reviewed appear to show that although in the present position of the problem it may not be possible to draw definite conclusions regarding the suitability of a sheet metal for industrial cold pressing and drawing

from the results of cupping tests, even if carried out by means of oil pressure, yet the Jovignot method of testing places at the disposal of the sheet metal industry a simple and rapid method of testing which produces a cup of known geometrical shape, eliminates the effect of friction and of the surface condition of the edge of the test-piece and provides a measure of the surface deformability of the metal. This group of properties allows one to conclude with Gough and Hankins that the fluid-pressure cupping test merits the attention of engineers and ought to be made the subject of thorough investigations

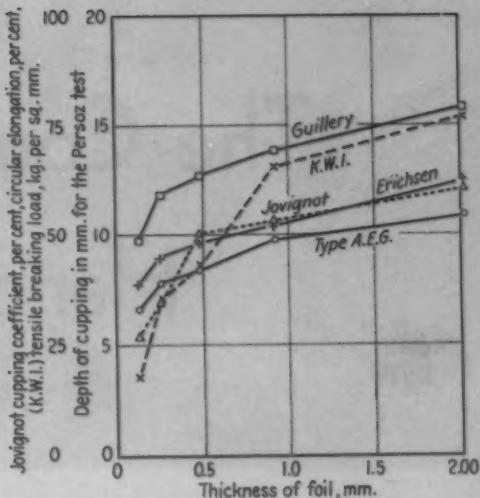


FIG. 13—Comparison of cupping tests on annealed aluminum.

to complete those reviewed in the foregoing.

Japan's Tin Plate Imports Hold Up Despite Domestic Output Increase

TOKYO (Special Correspondence).—Imports of tin plate into Japan remain relatively stable over the past nine years despite a sharp increase in domestic production. Government figures show.

During that period the smaller firms slowly gained ground against Yawata, largest producer and prices for this product are fixed at monthly meetings.

Japan Iron Mfg. Co. (capital Y. 359,812,000) is the largest of all tin plate manufacturers in the country. The company's tin plate work is done at Yawata. It is the only plant where manufacture is done in continuous process from the ore.

The company's production dates from the year 1923. The output and imports in recent years, according to official statistics, are as below, the figures being in metric tons:

	Production	Imports
1923	959	55,343
1926	11,530	49,995
1930	22,431	68,843
1931	27,498	47,749
1932	34,317	63,470
1933	35,989	79,915
1934	61,161	88,082
1935	94,920	53,827
1936	138,270	51,168

The appreciable increase of production indicated for 1934 is due mostly to the contributions which those other than the Japan Iron Mfg. Co. began to make. The production since then by major manufacturers are as follows: (The figures are in metric tons.)

	1934	1935	1936
Yawata Iron Works.	55,230	84,808	100,237
Fuso Kogyo (Steel).	5,981	6,160	13,768
Toyo Seikan (iron sheet)	9,663	21,917	
Kawasaki's Iron Sheet Section	446	2,348	

Yawata's position is predominant. Its product is directly supplied to large consumers such as the military and official establishments, petroleum companies, etc. Marketing is done through Mitsui Bussan, Mitsubishi Shoji, Iwai Shoten, Ataka Shoten.

Toyo Kohan (capital Y.5 million), of Osaka, was formed in 1934 as a subsidiary of the Toyo Seikan (tin-can making), operating its workshop at Shimomatsu, Tsuno-gun, in Yamaguchi prefecture. The company buys tin bars from Japan Iron Mfg. Co. and makes 2000 to 2500 metric tons of plate each month. Most of the output is supplied to the Toyo Seikan, of Osaka, the largest manufacturer in the same line, and far less quanti-

ties to the Nippon Seikan, another tin-can making company.

Fuso Kogyo was founded in 1933 in Kanagawa, Yokohama, with a capital of Y.1 million, fully paid up. The raw material is supplied from the Kawasaki Dockyard Co. The output of plate is around 1500 metric tons a month. Sales are mostly made direct to consumers.

Nakayama Kogyo (steel works) was founded in 1935 at Tsurumi with a fully paid up capital of Y.2 millions.

Yodokawa Seiko Sho, as its name indicates, was established in January, 1935, at Nishi-Yodokawa-ku, Osaka with an authorized capital of Y.1.5 million, of which Y.900,000 was paid up. These two companies are supplied black iron sheets from the Japan Iron Mfg. Co. and others. They each turn out 300 metric tons of plate a month.

Yawata holds a meeting each month to fix the sale quotas and prices. In addition to the four sale agencies mentioned above, there are also six dealers in Tokyo, as many dealers in Osaka, and two in Nagoya engaged in marketing. The price for tin plate for oil cans is fixed every other month between Japan Iron Mfg. Co., the four major dealers, and Japan Petroleum Co. representing the trade.

The importation of tin plate is chiefly in the hands of Mitsui Bussan, Mitsubishi Shoji, Iwai Shoten, Asano Bussan, Sale Shokai, Cameron Shokai, etc.

The Control of Materials

Handling Systems

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

CHAPTER 18 of a Series on
Materials Handling
Methods and Equipment.



IN any industrial plant the various problems of handling materials parts in process of manufacture and finished goods, may be arbitrarily classified for the purpose of considering the features of control, under two broad heads:

1. Problems involving conditions under which the flow of production progresses continuously from point to point without interruption, from the receipt of the raw materials to the shipment of the finished product out of the plant.
2. Problems involving conditions

under which the nature of the manufacturing operations, of the necessity for temporary storage during these operations, of the volume and nature of the handling work, and of the characteristics of the commodities handled, do not permit a rigid application of continuous flow principles.

Needless to say, the first head is the ideal toward which all mass production manufacturing operations tend. More and more as new plants are built or old plants are revamped to meet modern competitive situations, such processes are recast into that pattern which makes every motion, no matter how small or relatively unimportant, count toward that standard of production which involves the least effort, and hence the least cost. Scientific management has shown us that production with the least

effort is the result of two fundamental and interlocking factors: Specialization, or the breaking down of jobs into their simplest motion-components; and Co-ordination, or the linking of simple motion-components into an orderly and progressive flow of production. These interlocking factors, viewed from the standpoint of planning the operation to secure the utmost efficiency and economy, may be called "analysis" and "synthesis." Analysis will show *why* a process is necessary, and *what* the essential steps of that process may be. Synthesis shows *how* those steps may be put together to achieve a desired result most effectively, and *where* each step should dove-tail into the next. Whenever this dual process of analysis-synthesis is conscientiously applied to the planning of manufacturing operations the conclusion sticks out like a sore thumb that straight-line, continuous-flow methods reduce production costs. And the essential factor in the continuous-flow method is handling; that is, getting the materials or parts in process to the point of need at the moment of need, to permit the various manufacturing operations to proceed progressively at the most efficient and economical production speed.

It is of more than passing interest to note that, with all the marvelous advances in engineering attributed to the automotive industry in the past generation, the real factor which has set that industry in its present commanding position has been *organization*. Automobiles had to be brought within the range of low-income pocketbooks to become popular. That meant low production costs. Specializa-

CONTROL of the operation of this Chain Belt Co. chain conveyor is determined by the capacity of the macerating equipment to take the pulp-wood logs.



• • •
CONTROL of this Harnischfeger traveling crane serving a coke-plant stock pile is based on the need for delivering coal to the coke ovens.
• • •



tion of jobs and co-ordination of processes along the lines of continuous flow—both matters of organization pure and simple—made for lower production costs, thereby opening markets never available to the pioneers of the industry. More recently the continuous-strip steel mill has been developed on the same principle, effecting economies hardly dreamed of twenty years ago. And the same ideas hold in a hundred other industries, from the making of agricultural implements to washing machines. In brief, wherever mass production is the key to lower production costs, there the organization of continuous-flow methods forms a solution to the problem of economical manufacturing operations.

But not all production can be mass production. Always a demand will exist for relatively small quantities of certain goods or products which cannot economically be fitted into mass production methods. Or, even in large quantities

the nature of the manufacturing operations or the characteristics of the materials will set up a condition where the production is intermittent. Here the best that can be done is to emulate the continuous-flow principle to the extent of keeping every movement of materials *between* processes advancing in a forward direction; never back-tracking. For instance, certain types of furnaces are charged, then time must elapse until the melt can be poured and the furnaces charged again. The operation is intermittent and the handling of materials must likewise be intermittent. But the order of charging and the flow of materials to and from the furnaces can be so planned that all movements are in general progressively forward. Just as when a ship comes into port, ties up at a dock, has its cargo unloaded and a fresh cargo stowed in, all on a definite time schedule wherein every step dove-tails into the next, to eliminate confusion and delay, so

the jobs coming into the plant which require special materials, different operating routines, and out-of-the-ordinary effort to produce, may and should be so planned as to be put through the plant with the least confusion to other work, and the least effort. Under such circumstances the *control* is apt to depart materially from the ideal of continuous-flow; yet the nearer it can be made to approach that ideal, the more economical will the result prove to be.

The following discussion is an attempt to define more clearly these two sets of conditions, in terms of materials handling methods and equipment.

Continuous Flow Control

Where the ideal of the continuous flow of the materials or parts handled may be attained, conveying equipment of one type or another is almost invariably indicated. This may be at floor level, as with slat, apron or chain con-

• • •
CONTROL of this Robins belt conveyor installation at a large central station is predicated upon the condition of the bunkers and the arrival of coal-barges.
• • •





CONTROL of this Mathews conveyor system is a function of the time required to pass a basket of material through a continuous-run process oven.

veyors; above floor level at normal man-working height, as with belt, chain, slat, apron, roller or wheel conveyors; overhead, as with belt, chain, or trolley conveyors; on an incline, as with belt, chain, apron or bucket conveyors; or vertical, as with bucket, apron, or fixed-arm conveyors or skip hoists (skip hoists are intermittent in action but continuous in effect). The essential point to be considered in all these forms of equipment is, that movement proceeds in one direction only—forward. Consequently the most efficient utilization of such equipment depends upon placing each succeeding step of the manufacturing operations between which such equipment is

used, in progressively forward steps, so co-ordinated that no retracing movement is ever necessary.

The pace of production is thus set by the time taken by the *slowest* process operation of the entire production chain. This is the bottleneck. It automatically establishes itself as the control point which determines the speed of operation of the handling equipment. Manifestly there is little sense in delivering materials or parts to this point faster than the process in question can take care of them, or in taking them away faster than the process can deliver. If that particular process tends to slow all other operations to about one-half

the normal operating time taken by other processes in the chain, it may, of course, be possible to duplicate the slow-moving equipment at that bottleneck, so that one-half the materials or parts delivered there goes through one piece of process equipment and the other half through the duplicate equipment, and the combined deliveries cut the average processing time at that point in two. The essence of the problem of control is to find the bottleneck, and to speed up operations through that point to the average speed of all the processing equipment in the production chain. (By "process" here reference is made not only to chemical or metallurgical processes such as cooking, cleaning, or heat-treating, but also to purely mechanical work such as machining, or mixing, painting or assembling.)

That *average* speed just mentioned, is the rate of production of which the plant is capable. That speed having been determined, the speeds of operation of all intermediate handling equipment may be set, and the control equipment for each piece of equipment figured out. Suppose, for example, the speed of a belt conveyor is to be approximately two lineal feet per second, and the conveyor is to be driven by a standard electric motor with a normal operating speed of 1720 r.p.m. The first control consideration will be a means of reducing the motor speed to the desired operating speed of the conveyor. This will probably be a worm-gear reduction unit. But the conveyor running loaded may require a torque effort several times as great as when running unloaded. To a certain extent the reduction gear, in multiplying force at the expense of speed, will tend to smooth out the difference in power load and no-load, but not entirely. Consequently the motor should be chosen to meet the load-characteristics of the duty. In this case either an alternating current motor of constant speed, high torque, low slip characteristics, or a direct current motor, shunt wound, with constant speed characteristics, will prove desirable. This then, is the second control consideration; for either of these types of motor will tend to keep the operating speed of the conveyor at all times within close limits of variation. Finally, it may be desirable to provide some means of automatic speed control to limit still further variations in

CONTROL of this Towmotor industrial truck is dependent upon the agility of the operator in maneuvering his load from shipside to the warehouse.



• • •
CONTROL of these Industrial Brown-hoist magnet cranes depends upon the operators' skill in transferring cargo from ship to railroad cars.
• • •



the speed of conveyor travel between full-load and no-load conditions. This, the third control consideration, while not ordinarily necessary, may be found in a motor-speed governor actuated by upper and lower limit electrical relays.

An entirely different factor is involved in the mechanical functions of starting and stopping the conveyor equipment. Generally, this need only be the provision of a motor-starting push-button or switch located at a point conveniently within reach of one of the operators tending the process to which the handling equipment leads. It is always necessary to provide some means of stopping the flow of goods on the conveyor should something happen to stop the process equipment temporarily or to disable it; and of re-starting the flow when the disability has been overcome. Beyond this, however, it is becoming common practice to combine the electrical con-

trols of all conveyor equipment serving a continuous chain of processing operations, at a single master control-panel, so that all the conveyors may be started or stopped simultaneously. Under these conditions, the materials handling system is a production pace-maker, forcing the operators of each piece of processing equipment to take, use, and get rid of materials or parts as fast as the conveyors deliver them. There are, of course, obvious limitations to the "speed-up" that may be successfully instituted by this means; not the least of which is the high rate of spoilage which results when both equipment and operators are crowded to capacity. With care, however, such pace-setting often can, and will secure higher production rates with a normal quality of production.

Intermittent Flow Control

Problems of control of materials handling equipment used under con-

ditions of intermittent production-flow are much more complicated because they can so rarely be interrelated. Movements of industrial trucks and trailer-trains, for instance, may be, but rarely are arranged by definite schedules. These are highly individualistic performers, generally doing their best work when set at a specific job to be cleaned up as quickly as possible, then set at another job, possibly totally unrelated in nature to the first. For instance, a railroad car comes onto a siding filled with new materials. It must be emptied, then re-loaded with finished goods for out-shipment before demurrage charges begin. Or a quantity of finished stock must be moved away from a machine to temporary storage in order to free that machine for another operation. Or at certain times during the working day it is necessary to deliver particular loads to a special point, but the operation is not continuous. In all these cases it is probable that in-

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CONTROL of this Link-Belt foundry dry conveyor is adjusted to the speed at which the operators can fill the flasks with sand and compact the molds on the vibrator.
• • •



dustrial truck service will fill the need most economically. Control, as to availability for truck use, becomes a matter of planning ahead for the time during which the truck will be needed, and keeping the schedule flexible enough to accommodate such needs.

The mechanical control features of electric industrial trucks and tractors are today almost invari-

coming to a dead-stop. Such interlocking of controls is all in the interest of safety as well as of economical operation. Drum contact fingers (or relays where push-buttons are used) should have frequent inspection. Gasoline engine-powered units should have the same inspection required to keep an automobile in good running condition.

Crane service is almost always

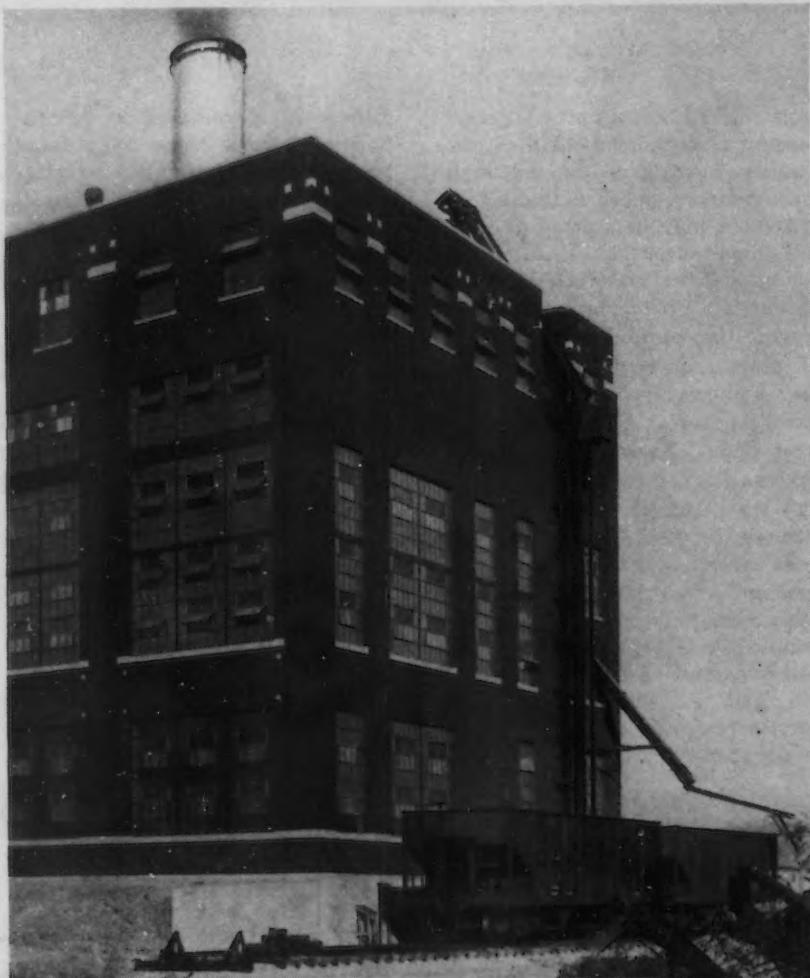
travel. As between the once-a-year service of a crane installed in a power house for the sole purpose of removing a turbine cover, and the every-minute service of a crane used for charging furnaces in a steel mill, there is every variety of intermittent and continuous work. The greater the amount of service, the greater the need for scheduling operations, in order to control the general usefulness of the equipment.

Mechanically, crane controls are a function of the operator. It is to him you must look for safe, rapid and economical operation. He must test, periodically, the longitudinal travel of the bridge, the transverse travel of the trolley, and the vertical travel of the hoist cable. Fully as important as the response of the motors must be the response of the braking mechanisms, and with this the proper adjustment of the stops which limit all three directions of travel. Where "plugging" is the practice, frequent inspections of motor windings for possible insulation burn-out is desirable. Constant inspection of all control mechanisms and instant replacement of all worn or faulty parts, is essential to safety—for the men, for the equipment, for the materials handled and for the building.

Electric hoists, hand hoists and winches are all primarily intermittent duty equipment, seldom susceptible of pre-planned schedule control. The best that can be done is to have them available when particular needs arise. Mechanically, the controls of electric equipment are largely of the push-button type, although many hoist operators still prefer the double pull-rope type. Periodical inspections of the actuating mechanisms of such controls should be made, to make sure the drum contact fingers and relays are not worn or damaged. Hand-cranked winches and chain hoists should be looked over occasionally to see that parts are working smoothly, are not worn, and are kept properly lubricated.

Hand trucks of all types must be classed as intermittent service equipment for which it is seldom possible to pre-arrange definite time schedules of work. Except in the case of lift trucks, mechanical controls present no problems; for mechanically-actuated lifts the

(CONCLUDED ON PAGE 41)



CONTROL of this Jeffrey skip-hoist is a matter of the need for transferring coal from railroad cars to the power-house bunkers as rapidly as possible.

ably interlocked in such a way that they cannot be started until the operator stands on the driving platform or depresses a foot pedal, or sits on a tilting seat and thus releases the brakes and connects the electrical system. Many are also equipped so that speed levers cannot be shifted until the truck or tractor attains predetermined speeds; making it impossible for instance, to start in high speed, or to go into reverse without first

intermittent in nature. When you need a crane, you certainly need it; at other times there may be long periods of idleness. A crane differs from an industrial truck in that it is always near at hand. A truck may be anywhere around the plant! The problem of scheduling crane service depends upon the amount of work it is called upon to do, the possibility of planning that work in a sequence of operations, and the limits of crane

Cleaning for Hot-Dip Galvanizing and Tinning

By WALLACE G. IMHOFF*



THOSE who have fully understood the basic problems of successful hot-dip galvanizing and hot-dip tinning, have for years stressed the importance of having the castings absolutely clean before attempting to coat them with either zinc or tin. An extremely large percentage of seconds, or work that has to be rejected entirely has been directly traced to imperfect cleaning of the castings of sand, scale and oxide, rust, oil and grease, or other foreign material. Therefore the emphasis of successful hot-dip galvanizing and hot-dip tinning of cast iron, gray iron, and malleable iron castings, must be placed upon the perfect cleaning of these articles before coating. Some of the modern cleaning equipment which has made this success possible, while at the same time cutting costs, will be discussed.

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The base materials for coating are cast iron, gray iron, and malleable iron. In order to know and understand the problems that have to be met, it is necessary to know the difference between these base materials, and what the requirements are to obtain a perfect coating.

Pig iron, the product of the blast furnace, contains from 3 to 5½ per cent carbon. Cast iron is made from pig iron and scrap in a smaller furnace, or cupola, and contains from 3 to 3½ per cent carbon. It is produced through simple mixing of pig irons of va-

rious compositions, usually with some admixture of scrap iron castings of similar composition.

The composition of cast irons is made up to suit the use of the casting, and the difference in chemical composition of the various grades of cast iron is reflected in the fracture of the iron. An iron low in silicon and high in combined carbon will have a "white fracture" and therefore has been called "white cast iron"; and iron fairly high in silicon and with a large amount of graphitic carbon will have a gray fracture, and therefore has been called

FIG. 1—Meat chopper housings of gray iron that have been hot-tinned. The one on the right has a poor coating. Note the rough surface at the right of the face, and the imperfect coating in the corner of the face and housing. The chopper on the left has a perfect coating.





FIG. 2—Rotoblast barrel for cleaning pipe fittings for hot-dip galvanizing. The castings shown were cleaned in an average time of 10 min. Photo by Pangborn Corp.

"gray cast iron," or simply gray iron. Gray cast iron has flakes of graphite of different sizes in it cutting across the iron (ferrite) crystal boundaries. This is the reason gray iron is soft and easily machineable.

Malleable cast iron is produced from the brittle white cast iron by heat treatment and is largely used for very small castings. The important fact to understand about malleable cast iron is the state in which the carbon exists. In gray cast iron the carbon is in the form of large flakes of graphite cutting across the iron crystals, and of course weakening the iron. In malleable cast iron, the carbon is at first in the combined form in the white iron, but annealing has the effect of gradually breaking down, or separating the carbon of the white iron, and leaving it in the form of soot, or "temper" carbon. These deposits of soot, or temper carbon,

occur throughout the iron crystals (ferrite) but do not cut them. The carbon is scattered in very fine particles of soot that occur in pellets, or areas in the iron crystals.

Surface Requirements

Since a zinc or tin coating goes onto the surface of cast, gray, or malleable iron castings, a discussion of the surfaces of castings is important. The surface of a casting depends to a large extent upon the composition of the iron. Carbon (in the combined form) tends to make iron very thin and fluid; phosphorus gives fluidity to iron by lowering its melting point. Manganese also tends to make iron thin and fluid; it also makes it tough and prevents blowholes by absorbing gases. High silicon removes the carbon from the iron in the form of graphite, and this in turn makes the iron thick, and viscous, because it is the carbon that gives fluidity to iron.

Now if these various things be considered in the light of surface requirements, we see that thick sluggish irons tend to pick up sand, and other foreign material which lodge in the surface of the casting. Such iron may also give a rough surface, so that we find for coating purposes the surface may be very poor. The requirements for depositing a high quality zinc or tin coating on castings are (1) an absolutely clean surface, free of sand, scale, iron oxide, or any foreign substance; and (2) a smooth surface.

Due to a lack of chemical knowledge, and poor cleaning equipment, the old methods of preparing cast, gray and malleable iron castings for galvanizing and tinning were very costly and tedious. Castings were sand-blasted and tumbled to remove the sand and obtain a smooth surface, but the process was long and required many tumbling units. In addition to this treatment pickling was also used as a final treatment before coating. Inexperienced operators used sulphuric acid alone, which removed the sand from the surface by dissolving the iron around the

FIG. 4—Hot-dip tinning kettles. Rough tinning an apron extension. Photo



sand grains, since sulphuric acid will not dissolve sand but does dissolve the iron. The sand was then washed off with buckets of water or a hose. Other more progressive operators used a hydrofluoric acid pickle which dissolves the sand, and gives much more satisfactory results. The two main factors that hampered these methods was that the casting was either burnt in trying to remove all the sand, or else the sand was not entirely removed from inaccessible places, thus resulting in an inferior coating. With gray iron castings, graphite is an additional element which causes trouble. The influence of these factors are evident in Fig. 1.

Cleaning Equipment

It has been mentioned that the sand blast and tumbling processes of cleaning castings have been used in the past. For concerns with a small production this equipment is still the most economical. For larger production, however, new equipment in the form of the "Wheelerator Tum-Blast" made by the American

pot, tallow kettle and pure tin kettle which has
by Acme Galvanizing, Inc.

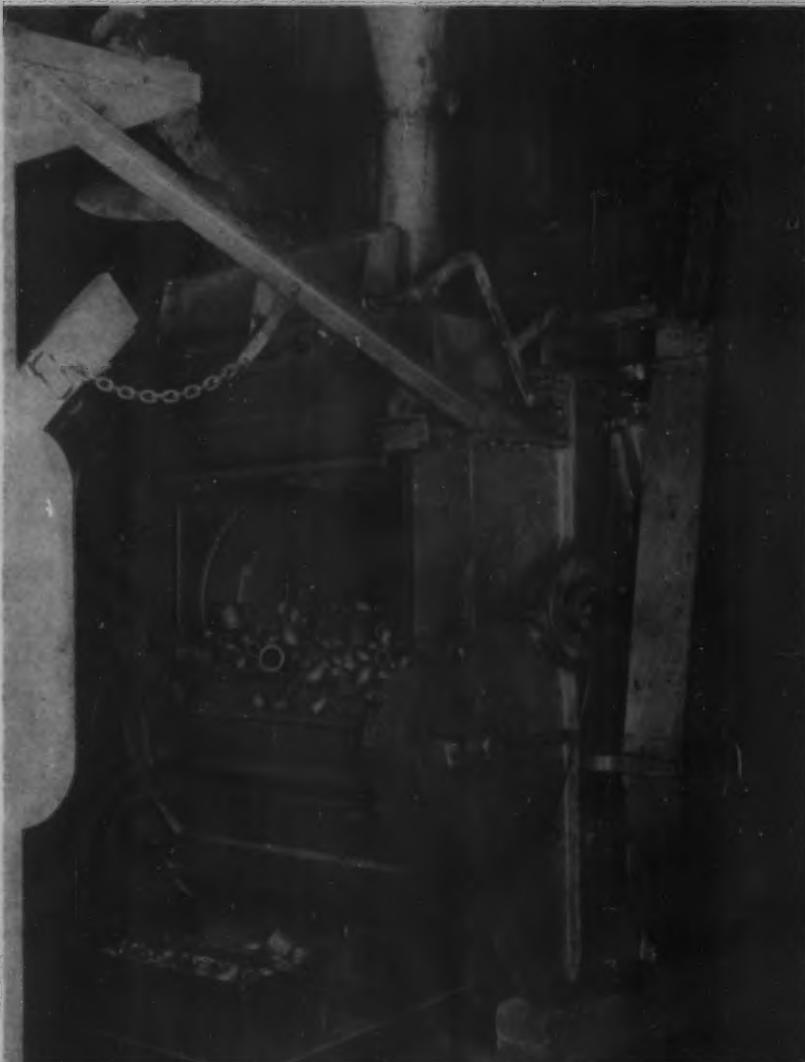


FIG. 3—Wheelerator at the Thomas Devlin Mfg. Co., used for cleaning pipe fittings made of cast, gray and malleable iron. These castings will be galvanized.

Foundry Equipment Co., and the "Rotoblast" made by Pangborn Corp., have so increased cleaning efficiency of castings, and cut costs so deeply, that a brief discussion of the performance of these two pieces of modern cleaning equipment is in order. There are two important features which will be commented on, namely, the perfection of cleaning the surface for hot-dip galvanizing and hot-dip tinning, and the production and operating costs of the equipment in actual plant operation.

The Rotoblast equipment, made by Pangborn, used for cleaning pipe fittings for hot-dip galvanizing is shown in Fig. 2. The castings are first dumped into a depressed bucket and then automatically lifted and dumped into the drum. As the drum revolves a stream of abrasive (steel) is thrown down on the work with

a Rotoblast wheel which operates at a speed of 2200 rpm. The steel abrasive works through the load of castings and out through perforations in the drum to a screw conveyor which conveys the abrasive to an elevator, which in turn lifts it to the Rotoblast wheel, thus completing the cycle. The load of castings seen in Fig. 2 was thoroughly cleaned for galvanizing in an average time of 10 min.

The Wheelerator equipment is another modern machine and a good idea as to the design and construction may be obtained by referring to Fig. 3. This unit is used for cleaning cast, gray, and malleable iron fittings and castings in the Thomas Devlin Mfg. Co., Burlington, N. J. A very large percentage of the fittings are hot-dip galvanized and therefore are cleaned in large quantities, and must have a perfectly

clean surface on which to deposit the zinc. This one Wheelabrator has replaced three large compressed air sand blast barrels, and the installation of another smaller wheelabrator has eliminated in all seven tumbling machines.

The cleaning in the Tum-Blast is due to an improved method of ejecting abrasive, that is by means of an unique application of centrifugal, tangential and air dynamic forces, set in motion by a wheel

electric hoist elevates the loading bucket to the level of the tumbling chamber, the castings are dumped into the chamber, and the cleaning cycle is started. The minimum average tonnage cleaned during any four-week period was 1,440 tons per hr.

The cost of cleaning has showed a marked saving over older methods. Over a long period the average cast has been \$1.49 per ton, which includes fixed charges, re-

rect from the sand is performed in 4 to 5 min. As the castings are required for the tinning department they are taken from storage, given a final cleaning in a Wheelabrator of from 4 to 6 min., which removes any rust or other deposits and also renders a smooth finish so essential in plated work.

After delivery to the tinning department the castings are immersed from 10 to 20 min. in an



FIG. 5—Tinning kettles, with alkali cleaning and pickling tanks shown against the wall. Photo by Acme Galvanizing, Inc.

revolving at 2250 r.p.m. Thus, the use of compressed air is eliminated.

Approximately 91 per cent of the work cleaned consists of hard iron as it comes from the foundry, and the balance is made up of annealed castings and a small amount of brass. Castings vary in weight from 0.5 to 75 lb. Hard iron is conveyed from the foundry to the cleaning and sorting floor by means of overhead skips. At this point the castings are transferred to a loading bucket operated in conjunction with an overhead trolley which in turn conveys them to the Wheelabrator. An

pairs, power, abrasive, maintenance and operating labor.

Cleaning for Hot-Dip Tinning

The previous discussion covered the use of modern cleaning equipment for hot-dip galvanizing. It is now also of interest to see the use of the equipment for cleaning the same material for hot-dip tinning. A Wheelabrator unit is in the plant of the White Mountain Freezer Co., Nashua, N. H. All castings are made for stock and are immediately sent to casting storage, after being cleaned and ground. This initial cleaning di-

18 per cent muriatic acid bath, after which they are rinsed and immediately placed in the tinning kettles.

Hot-Dip Tinning

The process of hot-dip tinning is far more sensitive to difficulties than is that of hot-dip galvanizing. Cleaning perfectly is absolutely imperative in order to secure a satisfactory coating. Miscellaneous and job tinning, tinning of steel, cast, gray and malleable iron, require not only great practical skill, but also a thorough knowledge of the basic scientific principles involved in the process.

Fig. 4 shows hot-dip tinning kettles. The installation is made up of three compartments—a rough tinning kettle, tallow kettle, and pure tin kettle with a pan extension. The instruments in the upper left hand corner of the picture indicate the pyrometer system which records the temperature of each individual kettle, as well as the temperature of the combustion area, electrically and automatically controlled. The use of brick in this furnace has been eliminated entirely. The result is a tendency to give more uniform control of the temperature due to the fact that the heat is not absorbed and then spent as in the case of most brick-type installations. This is a recent development in furnace design and construction of hot-dip tinning furnaces, and seems to be working out perfectly.

Fig. 5 shows the tinning kettles in another view and also the alkali cleaning and pickling tanks lined up on the side at the wall. The material is handled from an

overhead system and carried around into the liquid flux tank, then over to the rough tinning kettle where it is again fluxed, washed, dipped in tallow, then again in pure tin, then carried to the kerosene bath, then through several rinsing operations, and finally sawdust dried.

Tin is a very sensitive metal and often many peculiar things happen in the hot-tinning process. First, the proper removal of all oil or grease film is essential. Another practical feature is the correct pickling conditions, and elimination of all air contacting pickled surfaces prior to fluxing in the rough tinning kettle, and keeping the material submerged in the tin bath until it has entirely absorbed the heat of the bath. Cleaning methods must be watched to see that the solutions from one tank are not carried over into the following tank, eventually contaminating the solution and causing endless trouble which sometimes is very hard to locate.

Temperature control and a

knowledge of temperature for various types of material is certainly most essential, and proper timing of materials of the various types is also of great importance. The slightest variation in timing will mean a variation in the finished product. Every precaution should be exercised to keep the tin bath free from contamination. Care should also be taken that no flux is carried into the tallow bath.

After each day of operation the tin bath should be treated to remove the dross accumulation, and any traces of copper or other impurities.

The successful hot-dip tinning of gray iron castings involves many difficulties, some of which are beyond the control of the tinner. There is a variation in the castings produced by the different foundries, and often castings are received which cannot be given a first class tin coating. If a customer notifies the foundry that the castings are to be tinned, they will usually exercise more care in materials to produce the casting.

The Control of Material Handling Systems

(CONTINUED FROM PAGE 36)

mechanism should be inspected regularly for wear or breakage, and for hydraulic lifts the liquid cylinders should be kept well filled with the proper grade of oil.

Where the continuous-flow principle of handling can be adapted to a specific case, the control of the handling equipment may often be centralized and the system used to set the pace of production. For handling equipment feeding in to the flow-line, but not itself capable of being tied into a centralized control (as trucks, cranes, hoists, etc.) control schedules may then be worked out which will result in the deliveries of materials, parts or goods partly processed, to the main flow-line at such times and places as needed. Thus, in an automobile-manufacturing plant, many subsidiary lines of handling equipment, individually controlled, converge at exact times and places on the main assembly line, and the control schedules of all handling equipment

are determined by the speed and needs of that assembly line.

Where the continuous-flow principle cannot be adopted in whole or in part (and there are fewer and fewer such situations as the real advantages of that principle becomes better understood), control of handling equipment sched-

ules becomes largely a matter of insuring the availability of the equipment at the exact time and place when and where it is needed. The nature of the work to be done, the characteristics of the goods to be handled, the distances they are to be moved, and the total volume of handling may be such as to keep the equipment busy every minute, or may leave much of it idle for long periods. Control, in any case, requires ingenuity, and can never become automatic.

Stainless Working Methods Book

A NEW technical publication by Ludlum Steel Co., Watervliet, N. Y., entitled, "The Working of Silcrome Stainless Steel," links up, in a novel way, detailed instructions on methods of fabricating Ludlum stainless with information as to the grades of tool steel best suited to each operation.

This factual data book has been prepared for the use of engineers, designers, and other technical men interested in practical working methods, to guide them in using

Silcrome to greatest advantage. It contains practical advice on all the usual metal working operations, such as sawing, drilling, milling, threading, tapping; also on hot upsetting and forging, shearing, drawing, punching, spinning, brazing, soldering, welding, and the like. In addition, the book contains information on the proper selection, heat treatment, etc., of the tool steels for the various operations.

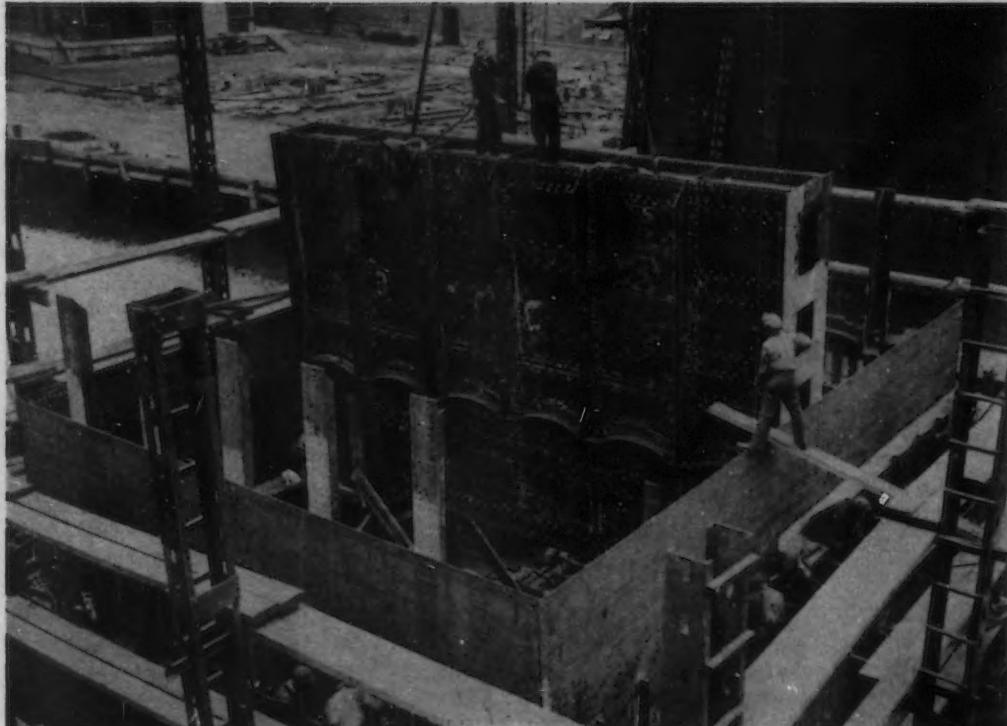
This manual, according to Ludlum, is the outgrowth of long experimentation in the laboratory and careful study of actual production methods.

Federal Shipbuilding Builds

An unusual piece of marine engineering work in connection with the north tube of the Lincoln (Mid-Town) Tunnel under the Hudson River between New York and Weehawken, N. J., was recently completed by the Federal Shipbuilding and Dry Dock Co., Kearny, N. J., subsidiary of the United States Steel Corp. The so-called caisson, illustrated in various stages of construction, forms part of the base support of the ventilating tower at the foot of 39th Street, New York, at the same time serving as



THE caisson, with its caulked seams, was erected on a floating drydock, off which it was floated when completed. Over 600 tons of plates and structural shapes went into its construction. The outside plates are $1\frac{1}{2}$ in. thick.



THE center strut girder is shown being lowered in place. It is 30 ft. long between the caisson walls, 19 ft. deep and $3\frac{1}{2}$ ft. wide. It weighs 45 tons. The arch flanges support the roof of the air chamber of the caisson.

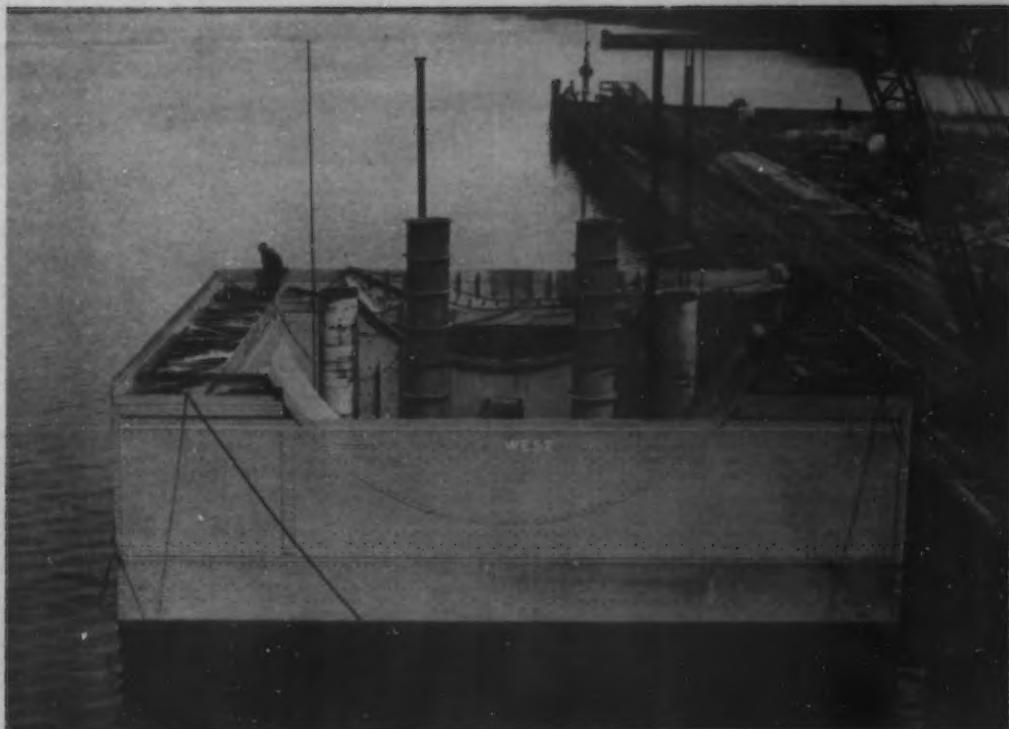
Caisson for the Lincoln Tunnel

a saddle for the tube itself. On the site, it is being sunk through 90 ft. of water and river bottom to bed rock. When it is located, the hollow sections will be filled with concrete.

The Port of New York Authority is building the tunnel and Mason & Hanger Co., Inc., is the general contractor. The American Bridge Co. will furnish the steel that will be erected on top of the caisson for the ventilating shaft.



In order to get a proper fit of the center strut girder, both ends were machined after assembly. The 30-ft. long structure was supported on its side as shown on the fixed table of a large universal boring mill with traversing head and inserted-blade milling cutter, seen at the upper right of the photograph.



THE completed caisson just before being towed to position on July 22. With 50 tons of concrete as ballast, it drew 20 ft. of water.

THIS WEEK ON THE ASSEMBLY LINE



... New Packard prices are jumped \$75 to \$215 on top of \$65 raise in August; new designs feature simulation of knees on rear wheels.

... Hand-to-mouth buying policy by industry disturbs general business analysts; labor seen as threat to smooth-running production.

... Union's internal warfare hits production schedules in Flint; Frankensteen wields power in Martin's stead.

... First Johansson block set in this country claimed as Cadillac man's prized possession.

DETROIT, Sept. 27.—Outstanding this week will be the public announcement of the new Packards, with completely redesigned Six and One Twenty models. The Packard company is spending \$13,000,000 in preparation for the biggest production year it has ever scheduled.

Satisfying the curiosity of months, the company now reveals details of a new system of rear spring suspension which is one of the chief features on the Six and Eight. Rear springs of these "junior" cars are still of the leaf spring type but from the standpoint of ride, the suspension system is said to give the same results as independent wheel suspension. The system involves the use of a roll control bar, a lateral stabilizer and

two-way shock absorbers mounted to oppose one another. The system differs radically from Buick's coil spring rear suspension.

At the ends of the spring leaves there are cup-like depressions. These contain "buttons," some of which are rubber and some oil-impregnated bronze. At the forward end the springs are mounted to the brackets with rubber bushings and rubber bushings are used in the spring shackles at the rear end. There are no metal-to-metal contacts in the spring mounting. The lateral stabilizer, rubber insulated, consists of a steel tube extending from the right rear spring pad to the end of a vertical bracket attached to the left side rail. On the senior line of cars, there are two of these tubes, the second one ex-

tending from the bracket to the right side rail.

The double acting shock absorbers of the junior cars are mounted so the arm of one extends forward, while the other extends to the rear, the effect being to resist braking or starting torque reaction of the rear axle.

The One Twenty has been rechristened the Packard Eight, so the 1938 lines are the Six, Eight, Super-Eight and Twelve, with wheel bases from 122 to 148 inches. Wheel bases on the Six and Eight, incidentally, have been increased seven inches. Bodies of the Six and Eight are now all steel with one-piece steel tops. Eleven sound deadening materials are employed. Thermostatically operated full-length radiator shutters are provided on all models.

Air drawn through the radiator is no longer vented through the hood louvers, which are now entirely decorative in purpose. Tunnels carry warm air from the engine through large openings in the lower skirts of the front fender. Lower body temperatures at the dash and front window ventilators, as well as better engine cooling, are claimed.

With the completion of Packard's program for the year, the company will have spent more than \$29,000,000 since it prepared to enter the low-priced field in 1933.

Packard is the first company to announce complete prices for the 1938 models. Following a \$65 advance put into effect a month ago, it now increases the price of the Six, by \$100, the Eight by \$75, and Super-Eight by \$160 and the Twelve by \$215.



Optimistic schedules for the next year are being set up by all of the manufacturers, increases for the most part being estimated at 10 to 20 per cent above the past model year's production, although the general picture for the model year by no means justifies the expectation that all of these can be successful.

One of the most ambitious programs is that set up by Willys. Under the direction of David Wilson, that company made good this year on the production and sale of 70,000 units and, now Willys announces the determination to build and sell 125,000 cars in the next year. Chevrolet, well over 1,000,000 with this year's production, sets a goal of 1,200,000 for the 1938 cars. Olds, having passed the 225,000 mark, is aiming at 250,000. Buick has capacity for 300,000 and Pontiac is aiming at the same figure, having sold more than 236,000 of its present run of cars.

Steel Buying Hand-to-Mouth

While the first of the month should see a sharp increase in orders for steel, purchases as a whole in the Detroit area are on a hand-to-mouth basis, a fact that disturbs analysts generally. Last March only about 2 per cent of the buying in this area was on a hand-to-mouth basis, 15 per cent a month in advance, 53 per cent three months in advance and 14 per cent six months ahead, according to the Purchasing Agents Association. By June, this situation had changed to the point where 12 per cent of buying was on a hand-to-mouth basis. Another third of the purchases were within the two-month range. Approximately 35

per cent of manufacturers were willing to buy two months ahead of schedule and the group willing to purchase 90 days ahead of its operations had decreased to 29 per cent. During the late summer the trend was toward buying three months in advance, but this was due in large part to new models coming out and the resulting effect on parts and accessories manufacturers. No figures are available

yet for September, but a partial survey indicates that the trend is strongly toward hand-to-mouth buying or, at the most, 30 days in advance of actual use. The purchasing agents, of course, reflect management's attitude.

The general expectation is for an unpredictable amount of scattered and generally minor labor troubles. With the resumption of automotive production, labor has become frac-



OPTIMISM over general business conditions in this country and the rest of the world is expressed by General Motors' president, William S. Knudsen, on the right. Both Mr. Knudsen and R. H. Grant, vice-president in charge of sales for the corporation, also minimize the general fear concerning foreign wars. Both students of the corporation's foreign affairs, they told Oldsmobile's field executives that under current economic conditions, with none of the large foreign countries economically independent, serious international conflicts are unlikely. Shown at the left in the picture are O. E. Hunt, vice-president in charge of engineering for General Motors, Mr. Grant and C. L. McCuen, general manager of Oldsmobile.

MULT-AU-MATIC STANDARD TYPE TOOLING
EASE AND SPEED OF SET-UP ON MULTIPLE
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tious again, as is shown by events in Detroit, Pontiac, Flint and Grand Rapids and in plants of General Motors, Chrysler, Briggs, the Detroit City Gas Co. and furniture factories.

It has been learned that Buick is behind schedule on its production because of slow production lines in the Fisher Body plant at Flint. It is impossible here to point to an actual slow-down strike, but apparently the internal union battle between the Flint group and international officers is causing some sulking by Flint members. As a matter of fact, an uninvited committee of General Motors UAW workers appeared before the international executive committee in secret session last Friday. Richard T. Frankensteen, acting president in the absence of Homer Martin, who is ill, refused to comment, but it was learned that the unofficial committee protested against lack of action on the part of the group now negotiating with the General Motors executives.

Another subject of discussion was the lack of regional meetings among members of the Flint UAW Local. Robert Travis, formerly organizational director at Flint for the UAW, spent an hour and a half in the executive board meeting on Thursday defending his administration during the past year.

Frankenstein is temporarily in complete control of the UAW, since Homer Martin became ill a week ago Tuesday. The executive board, of which Martin controls a majority, approved Frankensteen's appointment as assistant president. This will also permit him to act if Martin is absent as a result of a new post given to Martin by John L. Lewis last week. Martin now is in charge of organization work in the nation's toy, doll and novelty industry. Further crossing of lines of authority within the CIO organization is indicated by the appointment of a United Mine Workers' economist, Jett Lauck, to hold a similar position in the UAW.

After Frankensteen had assumed the duties of acting president, a dispute arose as to whether Martin had named him temporarily or permanently. Martin's friends insisted that the appointment was permanent.

Chrysler Wage Rise Asked

The Briggs plant was tied up for one night late in the week in a dispute over production line speed. Chrysler, shifting into high gear on 1938 models, is again negotiating with the union. Herman L. Weckler, vice-president of the corporation, has received demands for

general wage increases for more than 50,000 of the company's employees, although the Plymouth unit was the one actually involved in the controversy. A minimum wage of \$1 an hour was asked. The threatened strike against the Detroit City Gas Co., together with a three-way dispute among members of the American Labor League, the Employees' Association and the CIO union, will be settled, it is hoped, by an election this Thursday.

In Grand Rapids, the UAW last week added a fifth strike to the list of disputes now on its hands there. The W. B. Jarvis Co., automobile parts manufacturer, was closed following demands for a closed shop, check-off system and wage adjustments. Others involved in strikes there are furniture manufacturers and a knitting mill. Grand Rapids, incidentally, appears to be the first city to hear open demands from the UAW for the check-off.

Union employees of the General Motors Truck & Coach Co. at Pontiac have voted for a strike in the Yellow Cab unit, but to all intents and purposes this is just a threat, because the international union appears to be in control of the situation there and anxious to avoid any break while negotiations are being carried on with the corporation.

In Toledo last week a smashing defeat was handed the CIO in a municipal election to amend the city charter. A two-to-one vote supported the present nine-member council against a proposal for a 21-member council.

Over at Muskegon, the outlook for the Continental Motor Corp. is more promising than at any time since 1929, according to W. R. Angell, president. By Nov. 1 at least

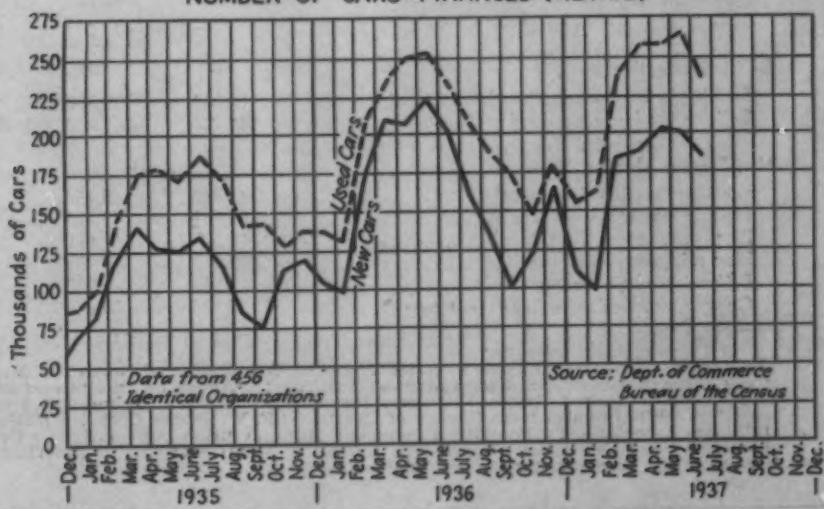
300 men will be added to the present force of 1100, with the bulk of new production represented by two new contracts from motor truck and trailer manufacturers.

Nicholas Dreystadt, general manager of the Cadillac-LaSalle plant, attaches a lot of sentiment to a set of Johansson blocks in his possession. It is, he says, the first set ever used in this country. This first set, purchased in 1910, contains 81 pieces ranging from 4 in. in length to one that is 0.050 in. thick. Contrary to present practice of the 68 deg. working temperature, these were fixed at 66 deg. O. J. Snider, inspection superintendent at the plant, recalls that only the most skilled operators were permitted to handle the blocks when they first arrived at the factory, a vast difference from the present, when Johansson gages are common in the automotive plants and other accurate visual and electric gages are used by the hundreds in production checking.

Production Points Upward

Ward's Automotive Reports indicate that automobile production is pointed sharply upward. Last week's production is set at 28,030 cars and trucks for all plants in the United States and Canada. This compares with 30,150 the previous week and 20,597 a year ago. The R. L. Polk & Co. report estimates total August sales at over 300,000 passenger cars in 38 states. This is approximately 17.76 per cent higher than sales for August a year ago and only 15.39 per cent less than July sales, which were 365,000. Truck and commercial car sales, Polk reports, are holding up surprisingly well. Registrations for 38 states reporting to date are 37,402, which figure is 0.63 per cent lower than August a year ago and minus 4.32 per cent lower than July sales.

NUMBER OF CARS FINANCED (RETAIL)



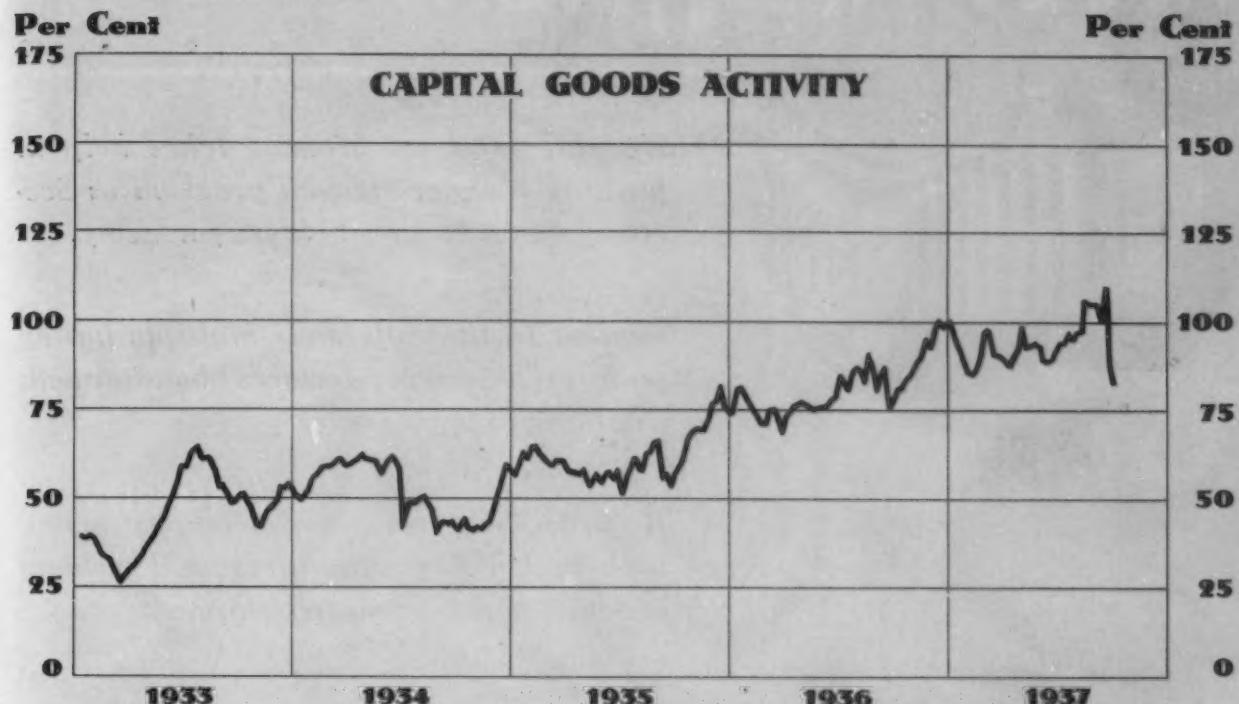
Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

	August 1937	July 1937	August 1936	Eight Months 1936	Eight Months 1937
Raw Materials:					
Lake ore consumption (gross tons) ^a	5,373,264	5,236,487	3,968,845	27,407,391	39,983,710
Coke production (net tons) ^b	4,829,862	4,707,106	3,993,602	29,104,700	37,056,796
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	2,711,721	3,498,858	2,711,721	18,834,215	26,811,269
Pig iron output—daily (gross tons) ^c	87,475	112,866	87,475	77,189	109,882
Castings:					
Malleable castings—production (net tons) ^d.....	.....	45,479	42,253	360,758	.....
Malleable castings—orders (net tons) ^d.....	.....	41,353	45,179	351,265	.....
Steel castings—production (net tons) ^d.....	.....	86,978	81,574	.....	.....
Steel castings—orders (net tons) ^d.....	.....	57,799	59,393	.....	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e	4,861,789	4,556,596	4,184,287	29,374,754	38,183,018
Steel ingot production—weekly average (gross tons) ^e	1,097,469	1,030,904	944,534	842,649	1,099,741
Steel ingot production—per cent of capacity ^e	83.55	78.49	72.11	64.33	83.73
Finished Steel:					
Trackwork shipments (net tons) ^g	7,530	8,252	6,401	47,209	69,790
Fabricated shape orders (net tons) ^g	117,612	160,970	110,687	1,071,720	1,197,381
Fabricated shape shipments (net tons) ^g	158,228	144,560	142,709	990,077	1,082,844
Fabricated plate orders (net tons) ^d.....	.....	26,854	28,319	255,610	.....
U. S. Steel Corp. shipments (tons) ^h	1,107,858	1,186,752	923,703	6,905,904	9,908,884
Ohio River steel shipments (net tons) ⁱ	133,650	163,705	113,560	689,676	955,045
Fabricated Products:					
Automobile production, U. S. and Canada ^k	405,064	456,775	275,934	3,322,249	3,737,289
Construction contracts, 37 Eastern States ^l	\$285,104,100	\$321,602,700	\$275,281,400	\$1,807,356,700	\$2,100,358,000
Steel barrel shipments (number) ^l.....	.....	715,014	588,660	5,186,644	.....
Steel furniture shipments (dollars) ^l	2,022,913	\$2,071,417	\$1,438,611	\$12,160,745	17,804,516
Steel boiler orders (sq. ft.) ^l.....	.....	979,316	1,074,597	6,846,063	.....
Locomotive orders (number) ^m.....	.....	3	3	134	.....
Freight car orders (number) ^m.....	.....	1,030	3,225	34,248	.....
Machine tool index ⁿ	179.8	171.1	127.5	†135.5	†180.9
Foundry equipment index ⁿ	257.5	204.0	145.4	†148.8	†229.9
Foreign Trade:					
Total iron and steel imports (gross tons) ^p.....	.....	47,012	60,697	427,782	.....
Imports of pig iron (gross tons) ^p.....	.....	8,310	12,524	122,527	.....
Imports of all rolled steel (gross tons) ^p.....	.....	26,116	28,216	171,622	.....
Total iron and steel exports (gross tons) ^p.....	.....	889,438	295,341	2,223,670	.....
Exports of all rolled steel (gross tons) ^p.....	.....	285,782	89,128	715,983	.....
Exports of finished steel (gross tons) ^p.....	.....	224,121	79,617	650,530	.....
Exports of scrap (gross tons) ^p.....	.....	420,097	194,600	1,437,690	.....
British Production:					
British pig iron production (gross tons) ^r	712,600	729,300	635,800	5,046,000	5,432,900
British steel ingot production (gross tons) ^r	987,700	1,059,200	872,700	7,591,000	8,385,300
Non-Ferrous Metals:					
Lead production (net tons) ^s	46,965	45,496	33,542	297,133	346,595
Lead shipments (net tons) ^s	54,551	47,727	46,388	301,121	414,918
Zinc production (net tons) ^t	48,309	49,181	43,614	352,899	378,080
Zinc shipments (net tons) ^t	50,643	49,701	46,085	340,463	419,808
Deliveries of tin (gross tons) ^u	7,580	4,980	5,385	49,525	56,995
Copper production, refined (net tons) ^v	80,135	79,611	55,410	465,575	647,211

^a Three months' average.

Source of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f American Institute of Steel Construction; ^g United States Steel Corp.; ^h United States Engineer, Pittsburgh; ⁱ When preliminary from Automobile Manufacturers Association—Final figures from Bureau of Census; ^j F. W. Dodge Corp.; ^k Railway Age; ^l National Machine Tool Builders Association; ^m Foundry Equipment Manufacturers Association; ⁿ Department of Commerce; ^o British Iron and Steel Federation; ^p American Bureau of Metal Statistics; ^q American Zinc Institute, Inc.; ^r New York Commodity Exchange; ^s Copper Institute.



The Iron Age Weekly Index of Capital Goods Activity

(1925-27 = 100)

Last week	82.8	Same week 1933	48.9
Preceding week	88.6*	Same week 1932	33.5
Same week last month	104.2	Same week 1931	53.1
Same week 1936	75.6	Same week 1930	78.3
Same week 1935	52.8	Same week 1929	115.4
Same week 1934	43.6		* Revised

ACTIVITY in the production and distribution of durable goods for the week ended Sept. 25 declined 5.8 points to 82.8 per cent of the 1925-27 average, according to *The Iron Age* seasonally adjusted index. The index now stands at the lowest level reached this year. Slight gains in car loadings of forest products and activity in the Pittsburgh area were erased by losses of 6.0 points in steel production, 17.0 points in automobile assemblies and 5.2 points in heavy construction awards. Automobile assemblies have apparently reached the bottom of the model turnover period.

and resumption of assemblies by Chevrolet and Ford will probably end the downward movement of the index for this year.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	76.0	-4.0
Automobile production (number of cars and trucks)	28,030	-2,120
Railroad loadings of forest products (number of cars)	39,636	+5,892
Pittsburgh industrial production and shipments (index number)	103.7	+1.6
Construction contracts awarded (total value)	\$43,677,000	-\$2,670,000

Components of The Index (1) Steel Ingot Production Rate, from *THE IRON AGE*; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

WASHINGTON



... *Housing interests promise Ickes help in pushing Wagner-Steagall program as Secretary again blames bidders for delay.*

... *Cement Institute defends multiple basing point price system; declares abandonment would bring monopoly.*

... *Records show iron, steel products second high in PWA expenditures as President orders "pump-priming" stopped.*

By L. W. MOFFETT
Resident Washington Editor
The Iron Age

• • •

WASHINGTON, Sept. 28.—Housing interests filed into the new streamlined Department of Interior building last week and promised "Honest Harold" Ickes their cooperation in administration of the \$500,000,000 low-cost housing and slum clearance program embodied in the recently enacted Wagner-Steagall housing law.

Although the occasion was advertised as "an open discussion" of the low-cost housing problem, newsmen and others who had not received a gilt-edge invitation were barred and after the first session Secretary Ickes, not in the best of spirits, was reluctant to discuss what went on at the meeting. Out of the 40 invitations issued, only 20 acceptances were represented at the conference although some 16 pinch-hitters were on hand, bringing the total conferees up to 40 or so.

Green Represented

William Green, AFL head, whose organization was more active in lobbying for the Wagner housing bill than for any other six pieces of legislation last session, stayed

away from the meeting but sent two spokesmen to represent the AFL segment of organized labor.

John L. Lewis, generalissimo of the CIO forces, wasn't even invited but his UMW Counsel Henry Warrum was present to reflect the CIO school of thought which, on the subject of housing, parallels the AFL view.

Howard A. Gray, housing director of the curtailed PWA, was among government housing experts on hand and received an inferential boost for the job of administering the new housing program, a post to be filled shortly by the President. In defending the PWA program, Mr. Ickes said he thought Gray had done a good job.

One Big Headache

Nathan Straus, philanthropist and New York Housing Authority head, whom Senator Bob Wagner and Treasury Secretary Henry Morgenthau would like to see made housing administrator, also was the recipient of an Ickes invitation but did not attend the conference. Neither did Wagner nor Morgenthau but each sent representatives. The former is the sponsor of the bill which has been kicking around Capitol Hill for almost three years. Morgenthau viewed the housing bill from its inception as one big headache and has been groping ever since for money to finance the program.

Ickes resorted to his old tactics of assailing collusive bidding, a subject on which he has had little

to say in recent months, and told the delegation in his opening statement that it had been responsible, among other things, in delaying the PWA housing program.

He cited contractors, builders and labor unions as guilty of collusion in bidding and explained that on one project in Detroit alone, the Government had been saved \$1,700,000 by accepting a "bona fide" contract and refusing one allegedly reflecting collusive bidding.

Sidesteps Costs

He gingerly avoided any mention of rising costs which are directly attributable to governmental expenditures and the resultant tax burdens and thereby avoided any intelligent discussion of the subject.

Mr. Ickes might have mentioned, for example, that taxes on a ton of steel amount to about \$4 annually and that the high cost of Government is a contributing factor of huge proportions. According to the American Iron and Steel Institute 100 iron and steel companies paid \$86,438,993 in taxes during the first half of 1937, an increase of 105 per cent over the same period of last year.

There was evidence at the conference that if Ickes has his way, and he probably will, the new housing program will be closely patterned after what his aides describe as the non-Federal building policy followed in PWA's projects. That is, construction will be designed and sites selected by local

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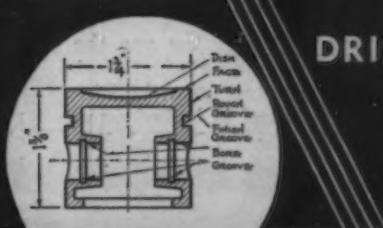
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groups, with the housing authority in Washington providing guidance and the money.

Ickes has been represented as desiring a highly decentralized set-up for the new housing program although he was told by a few conferees at the conference that "strong control" from Washington is vital since local groups are unable to deal adequately with the housing problem.

From the varying shades of opinion and beliefs on housing policies voiced at the conference, Ickes and his lieutenants hope to arrive at some equitable policy that will make as smooth sailing as possible for the program which contemplates a Federal subsidy of \$20,000,000 each year for 60 years.

May Sell Bonds

The Housing Authority to be set up under the law is authorized to sell bonds, guaranteed as to principal and interest by the Government, to the amount of \$100,000,000 for the first year and not more than \$200,000,000 for each of the succeeding two years. The money which will be available for self-liquidating loans but not for annual contributions or grants will provide for the construction of about 175,000 dwelling units for families of very low income.

Formidable snags already rearing their ugly heads to the Ickes crowd, it developed, are that many cities are unable to furnish the 10 per cent required as their share of project costs.

Some odd 50 cities have failed to establish the necessary local housing authorities to supervise development of the projects and at least 18 states have yet to pass laws which will allow them to participate in the Federal housing undertaking.

Cost Big Problem

One of the greatest problems faced by the housing authority, it is admitted, is to keep the cost low enough to actually benefit those in the lowest income group. Ickes also sought information on that subject at the conference.

Andrew Eken, whose contracting firm built the extensive Hillside and Williamsburg PWA projects in New York City, told Ickes that the new housing set-up ought to get down to the brass tacks of simple construction so that low income wage earners actually could be helped. Urging the housing authority to get away from "too much idealism," he added:

"Those to occupy the dwellings should be made to accept something less than perfection. The perfect project is all right but it

can't be provided for \$5 a room per month."

Other spokesmen contended that construction costs could easily be made to come within the prescribed limits and that the real problem lies ahead when maintenance costs will have to be pared if rents are to be kept low over a period of years.

Construction costs, the act provides, are to be limited to an average of \$1,000 per room and \$4,000 per unit in cities of less than 500,000. In larger cities the limit is \$1,250 per room.

Whatever is done under the pro-

gram, the path is being greased for an extensive educational program to advise the public as to the need and scope of the Government's housing attempt, it is believed.

Charles Palmer, an Atlanta, Ga., housing expert, told the conferees that a comprehensive educational program should be outlined which would encompass all fields of public information including motion pictures, radio programs and newspaper publicity. It is reported that the sentiment expressed at the meeting was unanimous for extensive propaganda machinery as an integral part of the program.

Cement Institute Denies Price Fixing Defends Multiple Basing Point Plan

WASHINGTON, Sept. 28.—Standing by the favorable decision of the United States Supreme Court in the Cement Manufacturers' Protective Association case in 1925, the Cement Institute and its members in answers to a Federal Trade Commission complaint have strongly supported use of the multiple basing point method of quoting delivered prices, as well as other practices, such as the use of a freight rate book giving railroad charges on transportation of cement. The book is circulated by the institute to its members.

The complaint is directed against the institute and 75 cement manufacturers, who, the FTC says, produce 75 per cent or more of all the cement made in the United States. It alleges unfair methods of competition under the FTC act and price discrimination under the Robinson-Patman Act. All charges of violation of the anti-trust laws are denied.

While some of the answers are more detailed, those that have been filed so far with the commission are similar in substance and refute allegations of combinations in the use of the multiple basing point system to fix delivered prices. On the contrary, it is contended that abandonment of the system would eliminate competition and create monopoly.

Atlas Cement Explains

The complaint, like the one the commission has made against Cast Iron Soil Pipe industry in the Birmingham-plus case, is looked upon as a move by the FTC to abolish the basing point system in all in-

dustries, such as cast iron, cement, steel, flour, etc.

While more exhaustive than some other answers in the cement case, that of the Universal Atlas Cement Co., Chicago, subsidiary of the United Steel Corp., comprehensively sets forth the position of cement producers generally.

The company declared that the public interest is best protected by the long-established practice of meeting competition in the sale of cement. In marketing a standard and heavy commodity like cement, it was pointed out, it is possible to meet competition only by quoting destination prices. The alternative method of quoting f.o.b. mill prices, it was stated, obscures the competitive facts and obstructs the free play of competitive forces. If the further requirement is imposed that each producer must have a uniform f.o.b. mill price for all customers, it was added, competition is drastically curtailed.

Would Aid Monopolies

"The logic and result of the Federal Trade Commission's aim, as disclosed in this complaint, would be to foster monopoly," the company said. "To require each producer to net the same amount at his mill on every sale would cause a drastic shrinkage in the market of each mill and to that extent it would reduce competition. Furthermore, the commission's aim would guarantee to each mill or group of mills a zone where monopolistic power would prevail."

Like other respondents, the company cited the Supreme Court decision in the Cement Manufacturers' Protective Association case

in which the cement company said that all of its marketing practices have been specifically approved.

In the course of its decision the Supreme Court said:

"Effective competition itself tends to produce a uniform market price at a particular time but the level of such a price fluctuates from time to time. . . . Thus in the cement industry the destination method of marketing results in effective competition and is not an instrument whereby competition is restrained."

Natural Result

The court also declared that use of basing points is "the natural result of the development of the (cement) business within certain defined geographical areas."

Referring to FTC charges that the institute's freight rate books are employed to compute identical delivered prices, regardless of whether the rates in the book are officially correct or not, the Universal Atlas Co. said it has used this book since November, 1936, only because its use is the simplest and most economical way in which information of official railroad freight rates can be obtained.

The Cement Institute denied the books are furnished for any motive other than to supply producers with accurate information in convenient form. The institute declared that there is no understanding among producers that the institute rates should be used in the place of official rates.

Denial was also made by the institute that the respondents have cooperatively employed the multiple basing point system of pricing. The institute admitted that before and during the effective period of the NRA cement code attempt was made to obtain approval of a code provision which would require a division of customers into two classes, those to whom cement producers might sell direct and those to whom cement producers would be prohibited from selling direct.

Article Suspended

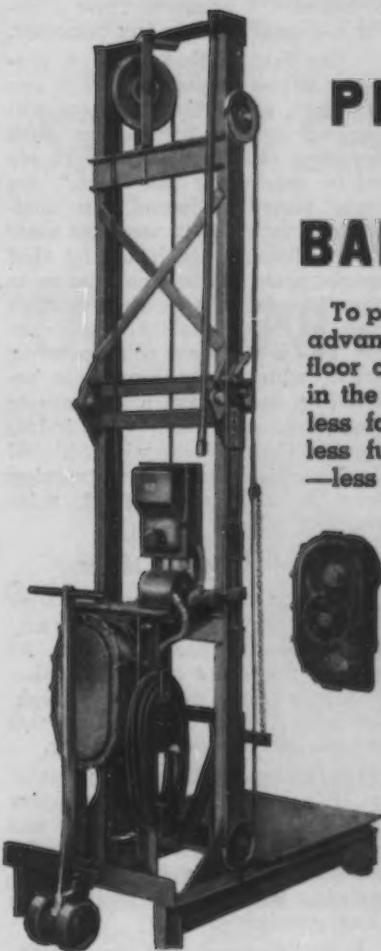
Later, it was said, the article was suspended but that the code authority, at the behest of NRA officials, tried to have it reinstated in original or amended form.

The institute denied that delivered prices are not the actual prices within the meaning of the Clayton Act as amended by the Robinson-Patman Act. Further, it denied that price discrimination can be determined or measured in terms of the amount which the seller nets in different transactions. Refutation also was made of

the charge that the respondents participated in any price discrimination or that they have done anything to eliminate price competition.

The institute described itself as an information and statistical organization only and said that the custom in the cement industry of selling cement at a destination was an established trade practice long before organization of the institute. It was asserted that the same considerations which caused the Supreme Court to approve the Ce-

ment Manufacturers' Protective Association and publication of the freight rate books now justify their compilation and publication by the institute. The rate book, it was stated, not only enables the manufacturer to calculate a delivered price on the basis of his own mill price, which he determines, to a point in the territory nearest in point of freight rate to his own mill, but enables him also to determine at once the freight differential which he must offset in order to compete with other manu-



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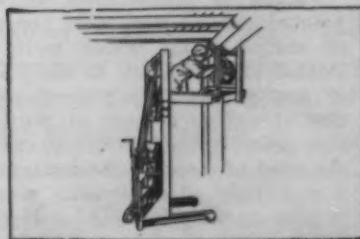
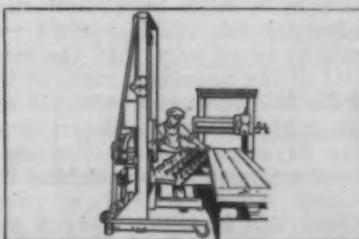
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The NRA cement code, it was pointed out, was approved by the President. The institute, it was explained, continued its freight rate and statistical service but devoted most of its facilities to the cement code authority. Following invalidation of NRA, the institute said, it has confined its activities to stated information services.

It denied that it has ever influenced marketing policies of its members or endeavored to control or influence their method of conducting business. Also, the institute said, it has not promoted or participated with members in any agreement concerning prices or marketing methods.

The Universal Atlas Co., like other producers, said that any differences in prices have been made in good faith to meet competition or otherwise pursuant to the Robinson-Patman Act.

Discussing development of the so-called multiple basing point method of marketing cement, the company answer said that there are two facts which must always be kept in mind.

Product Identical

"The first is that Portland cement is made under standard minimum specifications with the result that the product of different producers is substantially identical.

"The second is that cement is a heavy commodity with the result that it cannot be economically transported long distances. In fact, the average haul is less than 200 miles. Thus transportation cost plays an important, if not controlling, part in determining the limits of the marketing area of any plant."

Tracing the growth of domestic industry since the building of the first plant in the Lehigh Valley, Pennsylvania, about 1870, the answer said domestic plants during the early period of the industry were largely localized in Lehigh Valley and cement generally sold at f.o.b. mill prices.

Forces of competition, it was pointed out, shifted from the site of earlier mills, which were all located in one region, to the places of destination. The general practice of selling cement at destination prices grew, therefore, out of the need of meeting competition at a multitude of destination points, it was stated, and this method of pricing has been in use some 35 years.

In making his price, the answer

said, the producer starts with a figure that he believes he is warranted in securing for his product and adds to it the cost of transportation to the destination.

Two Leading Factors

"If in this way the producer is able to meet the lowest price quoted by any other producer, he is in the market," it was declared. "If on the other hand, he finds that his price so made is higher than the quoted or anticipated price of a competitor the producer must then determine whether he can afford to reduce and remain in the market at the destination."

There were said to be two controlling economic factors that tend to restrain a producer from offering a special price to any customer.

"The first is that when a producer quotes a special price to one customer, all of his customers will demand similar concessions with resulting chaotic conditions in his entire marketing structure," the reply stated. "Second, his competitors, in order to meet the market conditions established by that special price and in ignorance as to how general the price reduction may be, have usually established for themselves corresponding prices which have sometimes resulted in destructive price wars to the serious detriment of the industry and the producer who initiated the low price. Another restraining force is the law against price discrimination."

Basing Points Change

"Each producer may at any time make his own mill or plant or any other place a basing point. At present there are a great number of basing points scattered throughout the United States and this number is constantly changing.

It is estimated that approximately 75 per cent of the productive capacity of all cement mills and plants in the United States is located at basing points while remaining productive capacity is in close proximity."

It was declared that the destination price method of marketing cement does not involve an unfair method of competition. The quotation by a seller of a destination price for sale of his product was said to be no more than the exercise of the undoubted right of the seller to determine how he will sell his products. All producers quoting at a given destination must meet competition by matching the lowest prices quoted at that destination, it was pointed out, and consequently the prices quoted at any particular destination tend to be uniform—but not because any

particular marketing method is employed.

Discussion was then made of the Robinson-Patman Act allegation of price discrimination by use of the basing point method. It was declared that unless this method of marketing involves unlawful price discrimination when employed individually by one producer, it is difficult to see how an alleged combination to employ this method can import price discrimination, for a charge of unlawful price discrimination involves a showing that a price made or quoted by a seller in the sale of a commodity is discriminatory and obviously only the individual producer is engaged in actual selling.

The consequence of the complaint, said the answer, can only be considered in terms of the use of this method of marketing by an individual producer engaged in the sale of cement.

It was stated that the Robinson-Patman Act simply uses the term "price" without any definition of its meaning.

FTC, it was claimed, has simply tried to use the definition as reported to the House, but rejected, that the word "price" shall be construed to mean "the amount received by the vendor after deducting actual freight cost or other transportation, if any, allowed or defrayed by the vendor."

What Price Means

In the cement industry, it is clear that the "price of cement is the amount paid by the buyer," said the answer. "The charge that delivered prices include two items—the 'price of cement' and the 'price of its transportation' does violence to the language of the Robinson-Patman Act as well as to the common understanding of the term 'price.'"

The answer said that the only discrimination in price charged in the complaint is based upon an erroneous definition of the term "price."

Referring to competition with imported cement, the company said that because of the low wages paid by foreign producers and of the cheap ocean freight rates of foreign ships, foreign cement is often sold in Atlantic and Gulf port markets at less than out-of-pocket cost of domestic producers. The result, it was stated, is that cement prices for delivery to these destinations have frequently represented actual losses to domestic producers.

PWA Spending For Steel Products, Machinery \$46,763,035 Since 1933

WASHINGTON, Sept. 28.—Basing his action on the "passing of the economic extremity," President Roosevelt's order stopping further PWA spending for heavy work-relief projects has directed attention to outlays made by this "pump priming" agency for materials.

Records of the Bureau of Labor Statistics show that iron and steel and their products ranked second in the groups, being exceeded only by stone, clay and glass products, in value of material orders financed with PWA funds.

The total value of PWA financed purchases of materials since the inception of that agency in July, 1933, to June 15, 1937, was \$1,677,903,615. Of this sum \$484,895,506 was expended for stone, clay and glass products. Closely following were expenditures for iron and steel and their products, with a total of \$456,763,035 or 27.2 per cent of the aggregate expenditures for materials.

Outlays for machinery, not including transportation equipment, amounted to \$288,188,122 or 17.7 per cent of all PWA expenditures for materials during the four-year period. Combined, iron and steel and machinery expenditures constituted 44.37 per cent of the total.

Cement Orders Second

The largest expenditures for any single product were for cement, purchases which amounted to \$182,206,803. Next came structural and reinforcing steel, orders for which were valued at \$168,398,109. Ranking second in the iron and steel group were steel works and rolling mill products, not elsewhere classified, \$91,541,594. Cast iron pipe and fittings came next with a value of \$49,403,974.

In the machinery group \$149,022,106 went for foundry and machine products; \$72,630,493 for electrical machinery and apparatus; \$26,754,872 for engines, turbines, tractors and waterwheels and \$20,483,811 for pumps and pumping equipment. Representing a value of \$38,839,968 railroad freight car orders called for the heaviest expenditures in the transportation equipment group, while locomotive purchases totaled \$11,830,133. Total transportation equipment purchases were \$90,032,332.

Non-Ferrous Metals

Of the \$11,600,465 expended for non-ferrous metals and their prod-

ucts \$6,739,481 went for sheet metal work; \$2,212,227 for non-ferrous metal alloys, not elsewhere specified, and \$1,414,243 for copper products.

Interestingly enough the ratios of iron and steel and machinery values to the total PWA values were almost the same as their man-hour ratios. Man-hours required to produce and fabricate all the PWA materials from July, 1933, to June, 1937, were 940,898,150. Bureau of Statistics figures show that the production of iron and steel

products, required 258,456,100 man-hours or 27.47 per cent of the total.

Production of machinery required 153,062,220 man-hours or 16.27 per cent of the total. "Direct" work at the sites of construction required 1,405,757,992 man-hours, making a total of 2,346,656,142 man-hours in indirect and direct work, exclusive of production of raw materials, early processing and transportation.

Where Steel Went

The total value of material orders placed on construction projects financed by Federal funds from the beginning of the program to June 15, 1937, including certain items which are not actually construction materials, was \$2,740,606,667. This

Set New Standards of Production. Use LANDIS Collapsible Taps



The Pomona Pump Co., Pomona, Calif., increased production 100% threading column couplings merely by installing LANDIS Collapsible Taps. It's difficult to believe that such a gain could be made by a change so simple.

A typical example of this increase was on 7" couplings where the threading time on a 12 pitch thread 6" long was reduced from 24 minutes to 12 minutes.

May we send you more information about LANDIS Collapsible Taps?

Send for the LANDIS Check Book of Threading Costs. It will verify the efficiency of your present methods.

LANDIS MACHINE CO., Inc.
TAP DIVISION
WAYNESBORO, PENNA.

total was divided among the different Government groups as follows:

PWA, \$1,677,903,615; RFC, \$73,853,902; regular Government appropriations, \$320,881,738; Federal construction under Works Program, \$219,468,302; operated by WPA, \$448,499,110.

Expenditures for iron and steel products, in addition to PWA outlays, were RFC, \$34,724,966; regular Government appropriations, \$66,211,454; Federal construction

under Works Program, \$52,910,912; operated by WPA, \$84,896,664.

The President's order halting PWA work recalls that some time ago he complained of so-called high prices of certain products entering into heavy projects. He included iron and steel, copper and cement in the list of products he specified and at the time intimated there would be a let-down in PWA loans and grants and a turn to lighter work financed by Government funds.

Protests have been made against cancelling PWA projects, and there is speculation as to whether or not pressure will bring about revival of some of the projects.

Representative Alfred Beiter, Democrat of New York, has declared that he will protest to the White House any cancelling of projects for which communities have held bond elections.

On the other hand, strong support has been given Administrator Ickes for rejecting numerous projects because applicants were able to finance them without help, just as his action was approved by the President. The idea of slashing Government expenditures carries a strong appeal to taxpayers generally who feel that the Government should no longer finance non-Federal projects. Actually PWA was extended at the last session of Congress until July 1, 1939. Under the extension act \$171,000,000 in grants and loans covering 1253 projects have been approved, while PWA had \$290,000,000 under the extended act available for grants and loans.

With the diminishing activities of PWA its personnel has been reduced but despite reductions of about 2000 in January and 1000 since then it still has a staff of 7000. It was stated it will be further reduced.

On the other hand, the Wagner-Steagall Housing Act, also under Ickes' Department of Interior, will require a large personnel so that reduction in the PWA personnel will probably be more than offset by the personnel under the Housing Act. This act will call for both Government loans and grants.

Meanwhile the President ordered abolition of the National Emergency Council, effective Dec. 31, its functions to be transferred to the Bureau of the Budget.

VALUE OF PWA-FINANCED ORDERS FOR IRON AND STEEL AND THEIR PRODUCTS FROM JULY, 1933, TO JUNE 15, 1937

Bolts, nuts, washers, etc.	\$5,214,715
Cast iron pipe and fittings.	49,403,974
Doors, shutters, etc.	17,904,133
Firearms.	813,468
Forgings.	7,389,188
Hardware, misc.	14,794,820
Heating and ventilating equipment.	41,696,864
Nails and spikes.	2,212,797
Rail fastenings, exc. spikes.	6,746,848
Rails, steel.	22,860,233
Springs, steel.	629,141
Steel works and rolling mill products, n.e.c.	91,541,594
Stoves and ranges, other than electric.	794,326
Structural and reinforcing steel.	168,398,109
Switches, railway.	1,000,818
Tools, other than machine.	6,064,847
Wire products, n.e.c.	9,035,984
Wrought pipe.	10,261,176

ANOTHER WAY



—is to use a Radial which, without being oversize, bulky and cumbersome, can efficiently handle fairly big work.

Illustrated is a good example, and it represents substantial savings in first cost, direct labor, floor space, interest charges and depreciation. In short, MORE HOLES PER DOLLAR!

Write today for complete details

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Oakley, Cincinnati, Ohio

Super- Service Radials

CINCINNATI BICKFORD

Argentine To Take More Wire Fence

WASHINGTON, Sept. 28.—An increase in wire fence exports to Argentina is forecast in a report to the Commerce Department by the American consul in Buenos Aires, who said that pending legislation applicable to the Province of Buenos Aires, the largest cattle raising state in Argentina, may ban use of barbed wire on claims it is detrimental to the health of cattle and reduces the value of animal hides because of rips and tears inflicted.

In 1928 imports of barbed wire in Argentina reached 30,000 metric tons, of which 15,826 tons came from the United States. Foreign purchases have dropped continuously since, however, amounting in 1936 to about 15,000 tons. This country exported only 3290 tons of barbed wire to Argentina in 1936. The report said that with barbed wire imports curtailed, the country necessarily would import larger quantities of other types of fence wire.

Ohio Foundry Co. Election Ordered

WASHINGTON, Sept. 28.—The National Labor Relations Board has ordered that an election be held in the Ohio Foundry Co.'s plants Nos. 1 and 2 in Cleveland before Oct. 12 to determine the employees' exclusive collective bargaining group.

Workers will vote either for the International Molders' Union, an AFL affiliate, or the Amalgamated Association of Iron, Steel and Tin Workers, an affiliate of John L. Lewis' CIO.

The Labor Board at the same time announced recognition of the Metal and Machinery Workers Industrial Union, a division of the Industrial Workers of the World, as the bargaining group for employees in plant No. 4, the company's enameling plant. All three plants are in Cleveland.

Structural Safety of Automobiles Praised

WASHINGTON, Sept. 28.—Paying tribute to automobile manufacturers, designers, and

maintenance men, the U. S. Bureau of Public Roads, in its special report on highway safety and traffic conditions, has advised Congress that, from the standpoint of safety, automotive engineers recognize their obligations and are doing all they can to combine proper balance in a single mechanical unit which has "many different and often conflicting requirements for safety, efficiency and comfort."

The bureau reported that only 64,000 or 7 per cent of the vehicles

involved in accidents in 1936 were in a "dangerously defective condition."

"Every curve at modern speeds demands perfect balancing of centrifugal and frictional forces," the highway report continued. "Weakness in any one of a number of structural or mechanical elements in the vehicle may precipitate a crash yet somehow over 28,000,000 cars are so well built and maintained that they rarely fail structurally at critical moments."

HEAVY PRODUCTION METAL CLEANING with "Wyandotte" Metal Cleaners

The daily production averages 7022 Bumper Bars. The rejects from all causes averages 35 bars per day. Making allowances for the usual percentage of rejects from causes other than faulty cleaning, this production record indicates practically perfect cleaning.

May we co-operate with you, too?

Wyandotte
clean "chemically" clean
Metal Cleaners

THE J. B. FORD COMPANY
WYANDOTTE, MICHIGAN

Gain in Iron and Steel Carloadings Over Fourth Quarter of 1936 Expected By Shippers in the Pittsburgh Area

In a forecast of iron and steel carloadings for the fourth quarter in the Pittsburgh area, C. W. Gottschalk, general traffic manager of the Jones & Laughlin Steel

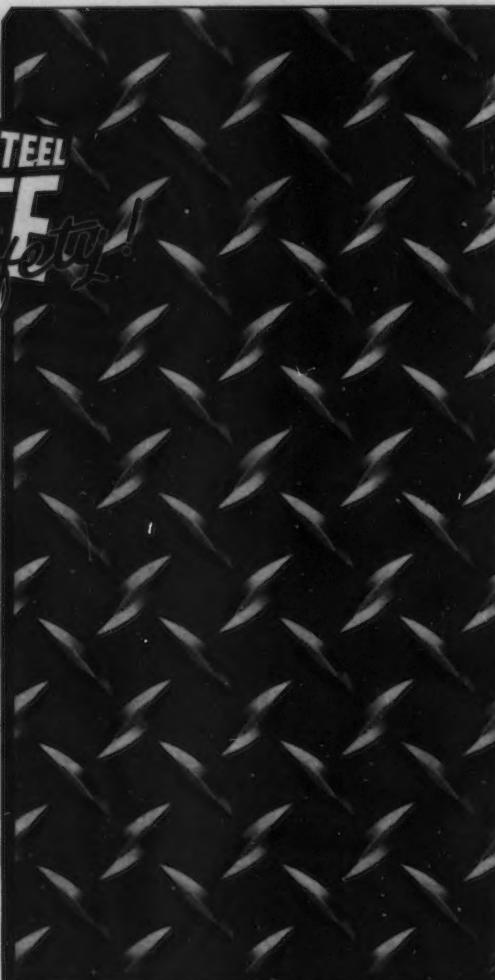
Corp., estimates that 218,036 cars will be required for the three months against an actual use of 207,062 cars in the fourth quarter of 1936. The estimate is based on

Specify
**A.W. ROLLED STEEL
FLOOR PLATE**
for Safety

"A.W." Rolled Steel Floor Plate is, above all else, engineered for safety. It gives men's feet a firm, safe grip—keeps their minds free from worry over loss of balance—speeds their work—and protects management as well as men against accidents.

But, in addition, "A.W." Floor Plate makes the most sanitary flooring—it drains quickly—is easily kept clean. And it is oil proof, crack proof, heat proof. It is the toughest flooring you can install—and will lick your toughest flooring problem.

Installation is quick—and PERMANENT. First cost is low.



"A.W." Super-Diamond pattern shown half size.

There is no maintenance cost.

Write for literature giving engineering data and illustrating 5 Floor Plate patterns to meet every possible flooring problem in industry.

ALAN WOOD STEEL CO.
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Branches: Philadelphia, New York, Boston, Detroit, Los Angeles, San Francisco, Seattle, Houston

111 YEARS' IRON AND STEEL MAKING EXPERIENCE

returns of a questionnaire sent to shippers and reflects an anticipated increase of 10,974 carloads or 5.3 per cent. Steel ingot output for the entire country averaged 77.17 per cent in the fourth quarter of last year. In the Pittsburgh district the average ingot output during that quarter was 73.6 per cent, according to THE IRON AGE estimates. The report was submitted to the Allegheny Region Advisory Board of the Association of American Railroads by the iron and steel committee, of which Mr. Gottschalk is chairman.

Responses, which were received from 97 companies, indicated that the general outlook for the fourth quarter is fair to good. Commenting on the situation, Mr. Gottschalk says:

"Shipments have been heavy and as a result order backlogs are being reduced rapidly. However, unfilled tonnage is still large enough to maintain for the time being fairly high operations at most producing points. Optimism so evident recently with regard to fall buying appears to have been tempered to some extent. Unless heavy buying develops shortly, curtailment in operations is thought inevitable."

"So far, improvement in buying has been confined principally to the automotive industry, and the demand from that group has expanded less than was anticipated a month ago, although counted on to expand more sharply by the end of September. The lag in steel buying by railroads and the building industry gives little indication of terminating soon."

"Wage and freight rate questions still are the more important issues remaining to be settled before the carriers are expected to be more liberal spenders for rolling stock. Farm implement and tractor manufacturers appear assured of sustained schedules through most of the balance of the year, leaving miscellaneous consumers to exert an important influence on the extent of curtailment in steel output in the fourth quarter."

A record-breaking year in the sale of mechanical refrigerators is predicted in Mr. Gottschalk's survey. He points to the fact that 1,902,742 household refrigerator units of this type were sold up to Aug. 1 and that the estimated number for the entire year is 2,378,000. On the basis of 190 lb. of steel per unit, the total steel consumption for this product in 1937 will be 225,910 tons.

Pittsburgh Steel Co. stockholders have approved a recapitalization plan eliminating arrearages on present 7 per cent preferred stock. This arrearage on Oct. 1 will amount to \$4,583,000 or \$43.50 a share.

Conference Board Sees Trade Decline

THE National Industrial Conference Board, in a general analysis of the industrial situation, points out that, in addition to the increased uncertainty in the outlook for business resulting from the drastic decline in security values, there are other factors suggesting the possibility of a further decline in business activity. Those factors include: (1) the abnormal labor situation, coupled with sharply rising wage costs; (2) the practical certainty that the Government will attempt to increase further its regulation of private business; and (3) the probability that an additional rise in taxes will become necessary.

On the other hand, the board's analysis notes that there are several reasons for believing that we are not on the verge of another major depression. Business has not yet recovered to its normal level. There is evidence of a long-term upward movement in building. Stocks of raw materials and manufactured goods do not appear excessive. No serious recession, the board says, has previously occurred under these conditions.

Tri-Cities Employment At Peak in August

FACTORY employment in the tri-city area of Moline, Rock Island and Davenport, Iowa, reached a new high mark on the employment barometer in August, according to reports to the Illinois Manufacturers' Association.

The number on factory payrolls in the last week of August, 1937, showed an increase of 21.3 per cent over the last week of August, 1936. Of 74 companies reporting, the net increase in employment for the month was 1267 persons. Increases in employment were reported in the agricultural implement, foundry, machine shop, clothing and candy groups.

A. F. of L. Fights "Isms," Green Says

THE American Federation of Labor remains "steadfast and uncompromising in its opposition to Communism, Fascism, Nazism and the different philosophies which these isms represent," William Green, Federation president, said

last week in an address before the American Legion convention at New York.

"Unfortunately," Mr. Green declared, "attempts have been made by the Communists to seek and secure control of the organized labor movement of the United States. They realize after years of concentrated effort that they cannot penetrate the sanctity of the federation or impair its solidarity.

"We shall oppose them vigorously and resist with all the resources at our command all at-

tempts which they make to substitute the form of government which they advocate for the free, representative form of government which our forefathers established here."

Hagan Corp., Pittsburgh, has received an order through Rust Furnace Co., Pittsburgh, for a complete combustion control with furnace pressure, gas pressure and air-gas ratio control to be installed on a regenerative soaking pit at Otis Steel Co., Cleveland.



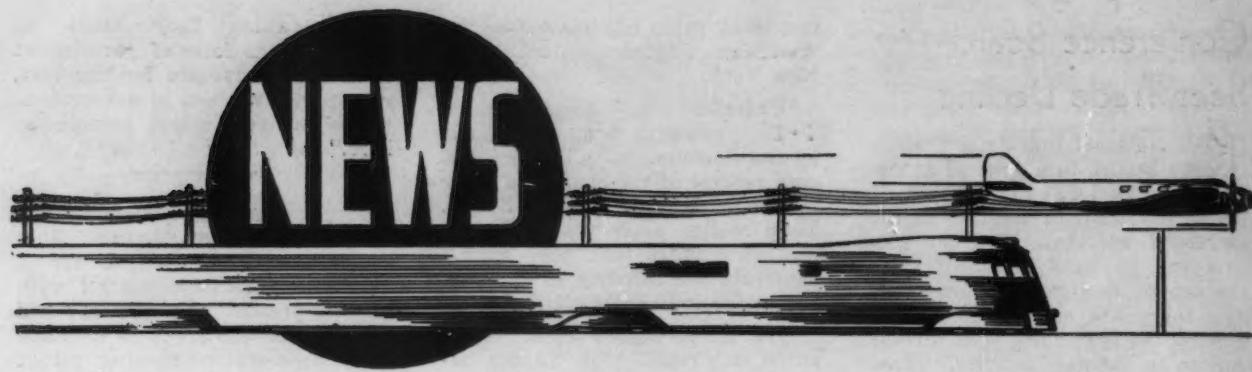
A manufacturer who brings the vigor of mountain air to town via air conditioning asked Parish to produce a pressed steel casing for his air conditioning unit. The result is shown here—a splendid Parish execution in cold rolled steel .0375" thick.

A clean-cut stamping like this—whether light gauge or heavy—gives greater sales appeal to any product. Parish has the equipment, laboratory, personnel and skill to do this for you economically. May we help improve your product?

PARISH PRESSSED STEEL CO., Reading, Pa.

PACIFIC COAST REPRESENTATIVE
F. Somers Peterson Co., 57 California St., San Francisco, Cal.

SPECIALISTS IN STAMPINGS OF DISTINCTION



Rustless Iron & Steel Corp. Opens New Addition Costing \$1,500,000

RUSTLESS IRON & STEEL CORP., Baltimore, held a reception at its plant today (Sept. 30) to a list of invited guests to signalize the formal opening of a \$1,500,000 addition to its plant, which doubles its capacity in the production of stainless steel, giving it a total of about 40,000 tons a year. The plant is fully equipped for every step in the manufacture of stainless steel bars, rods and wire from the ore to the finished product.

The plant was inspected by Baltimore public officials, executives of other Baltimore industries, visiting heads of other companies in the steel industry, manufacturers of stainless steel products and representatives of associations and trade publications.

After luncheon at the Belvedere Hotel, the guests were shown the Rustless process of stainless steel manufacture, the methods of laboratory control and typical applica-

tions of stainless steel in daily equipment, beverage bottling machinery, chain link fencing, valves, pump shafts, turbine, automotive



C. E. TUTTLE

and machinery parts and other uses.

The new additions include a modern three-high 12-in. merchant bar mill housed in a 240 x 80 ft. monitor type building, equipped with a 10-ton crane, billet heating furnaces and cooling pit; three 12-ton electric furnaces, equipped with 3500 kva. transformers; a 60 x 323-ft. brick and steel building which houses equipment for cold drawing and finishing rustless steel bars in straight lengths; a two-story service building, containing a dispensary, lockers, showers and dressing rooms and personnel office; a new electrical sub-station and transmission lines; cranes, storerooms and transportation equipment.

Other facilities at the company's plant include a 20-in. blooming mill and 14-in. and 9-in. bar and rod mills; grinding equipment, annealing, pickling and heat treating departments; a wire mill containing 16 drawing blocks and equipped to cold draw stainless steel rods into wire; bridge cranes for the handling and storage of raw materials, and chemical, metallurgical and research laboratories.

The additional facilities were designed by the corporation's en-

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*As the
Earth
Turns...*

the sun reveals complete new Morgan Mills, recently installed or about to be set up in various industrial centers of distant lands.

These widely scattered locations indicate more than the *international* nature of Morgan's business. They show that sound engineering and technical development are valued the world over—as incorporated into *complete* rolling mills by Morgan.

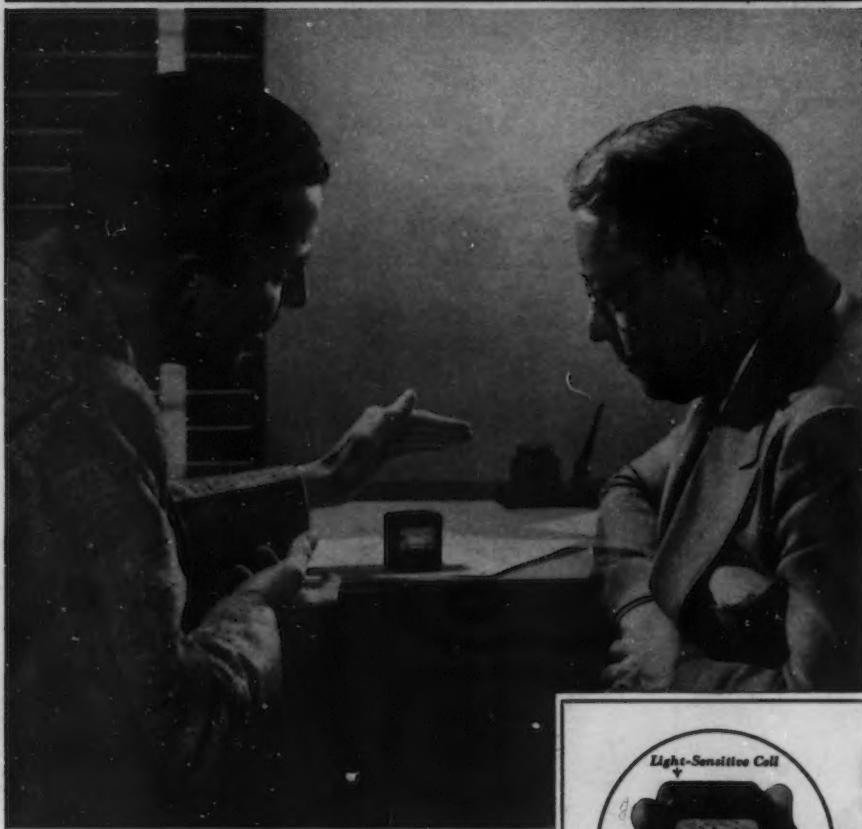
NEW MORGAN MILL INSTALLATIONS

- ★ CORBY, ENGLAND (*Stewarts & Lloyds*) — Hot Strip Mill
- ★ MAKEEVKA, RUSSIA (*Amiorg Trading Corp.*) — 4-Strand Rod Mill
- ★ CARDIFF, WALES (*Guest, Keen & Nettlefolds*) — Merchant and Strip Mill
- ★ SPARROWS POINT, MD. (*Bethlehem Steel Co.*) — 4-Strand Wire Rod and Merchant Mill
- ★ PORT KEMBLA, AUSTRALIA (*Australian Iron & Steel*) — Billet and Sheet Bar Mill
- ★ HAMILTON, ONT. (*Steel Co. of Canada*) — Rearrangement and addition to Billet Mill

MORGAN
WORCESTER
ENGINEERS AND
MANUFACTURERS

MORGAN CONSTRUCTION CO. Worcester, Mass. U.S.A.

2 WAYS TO GET ALL THE LIGHT YOU PAY FOR



Here are two simple ways to be sure that you are getting all the light you pay for:

1. Have the lighting in your plant and office checked by your local lighting company to make sure you are getting the most efficient use of the light you buy. A survey by a lighting expert, equipped with a G-E Light Meter, may reveal that there is not enough light for safe, easy seeing in certain parts of your plant. Very often, a few simple changes can be made that will enable you to use the electricity you pay for much more efficiently.
2. When you buy bulbs, get the new and brighter Edison MAZDA lamps. They actually give you more light than the lamps of a year ago without using any additional current. And they *stay brighter longer* than ever before. This is because the constant improvement and technical development made in General Electric lamp research laboratories is continually raising the efficiency of G-E bulbs year after year. That's why the trade-mark  on these bulbs assures you of getting full lighting value for your money. General Electric Company, Nela Park, Cleveland, Ohio.

EDISON MAZDA LAMPS
GENERAL  ELECTRIC

They stay brighter longer →



CHECK YOUR LIGHTING

With a General Electric Light Meter . . . that measures light as simply as a thermometer measures temperature . . . you can easily tell whether your plant and office are getting enough light for safe, easy seeing. The G-E Light Meter is priced at only \$11.50.



Engineering staff and H. A. Brassert & Co., Chicago.

Company Organized in 1924

Rustless Iron & Steel Corp., was organized in 1924 as the International Rustless Iron Corp. It was then a patent holding company, but in 1926 organized its operating subsidiary, Rustless Iron Corp. of America. The former Hess Steel Co. plant in Baltimore, which constitutes the nucleus of its present plant, was acquired the same year. The name Rustless Iron & Steel Corp. was adopted in 1933 at the time of a recapitalization. Rustless Iron Corp. of America was dissolved in 1936, when its assets were acquired by Rustless Iron & Steel Corp.

Officers and directors are: C. E. Tuttle, president and chairman of the board; T. F. McLaughlin, vice-president in charge of operations; J. K. Remsen, secretary and treasurer; G. B. Pumphrey, comptroller and assistant treasurer; Bruce, Borland, S. E. Bramer, Charles R. Hook, C. S. Payson, W. W. Sebald and Calvin Verity, directors. W. B. Pierce is sales manager. The company has branch sales offices and distributors in various important territories.

McKeesport To Vote New Stock

MCKEESPORT TIN PLATE CO. stockholders on Oct. 18, will vote on an authorization of 100,000 shares of preferred stock without par value. The directors intend to authorize the offering of a portion of this stock for subscription by present stockholders in order to provide approximately \$5,000,000 additional capital.

About \$2,000,000 of the new capital would be used to liquidate bank borrowings which amounted to \$5,000,000 on Sept. 15. The balance of this debt will be substantially reduced by seasonal liquidation of inventories and receivables.

About \$550,000 of the additional capital would be used for additional improvements and purchase of equipment and machinery at can manufacturing plants in Baltimore, Maspeth, N. Y., Hamilton, Ohio, and Boston. The balance would be used to reimburse the treasury for an equal amount of capital expenditures made during the past year or more for additional can manufacturing facilities.

The terms of the preferred have not been decided but it will be convertible into common stock and it is expected the dividend rate will be \$5 annually.

B. & O. Locomotive to Run 100 Mills Per Hr.

BALTIMORE & OHIO RAILROAD has just completed design of a new locomotive intended, with a power unit for each pair of driving wheels, to haul 14 standard Pullman cars at 100 miles per hr.

Calling its new locomotive a radical departure from the conventional type, the B.&O. believes the new unit will develop 5000 hp. with a continuous flow of power from its 16 cylinders similar to that of a multi-cylinder automobile.

The locomotive has a four-wheel front truck, four pairs of drivers, a four-wheel trailer truck, and a tank mounted on two six-wheel trucks. Each of four driving axles will be driven by a Bessler steam motor and each motor has four cylinders geared to its axle. No counterbalancing, no main and side rods and crank pins will be required, the railroad officials say.

Koppers To Build Colorado Ovens

KOPPERS CO., Pittsburgh, has been awarded a contract by the Colorado Fuel & Iron Co., to erect a battery of 41 coke ovens and operating machinery at Pueblo, Colo., plant. The amount of the contract was not revealed but is reported to be approximately \$1,000,000.

They will be Becker-type, low differential, standard cross flow ovens, with self-sealing doors. Erection is to be completed by mid-August next year. The present plant of the Colorado Fuel & Iron Co. consists of 120 Koppers-type ovens built in 1918 and 31 Becker-type ovens built in 1930.

Stainless Steel Use Growing in Hospitals

GROWING use of stainless steel in the hospital field is demonstrated in a long list of products displayed at the American Hospital Association's recent convention at Atlantic City. Included were:

Wall stands, sterilizers, complete door section, food conveyor, portable whirlpool hydro-massage bath tank, milk irradiator, thermotainer, bed pans, pus pans, catheter trays, dressing jars, irrigators, sponge bowls, solution bowls, wash basins, cafeteria insets, male urinals, kitchen sinks, pails, kitchen utensils, serving trays, combination cooking and serving utensils and surgical instruments.

Explosives



... AND YOUR PERSONAL SAFETY

"Foreign fleet threatens coast—
defense forces face ammunition
shortage as chemical industries
suffer production breakdowns."

It's unlikely you'll ever read spine chilling news like this. Chemical industries handling the life stuff of national defense are alertly directed. Consequently, their production is well guarded by such modern equipment as Lebanon Circle L Stainless Steel Castings.

Corrosive acids encountered in these "defense" industries have their

bite dulled by the soundness of Circle L workmanship and methods. All Circle L Stainless Steel Castings are produced in induction type melting furnaces by men who are specialists in corrosion-resisting equipment. They are "cast to a standard—not to a price".

SAFETY FOR YOUR PRODUCTION, TOO

No production ravaged by hidden corrosion is safe production. Both profits and customer relations may suffer from this Production Enemy No. 1. Remember, corrosion often stabs in the dark, unknown, unsuspected. Check for its presence at vital production points. Call in a Lebanon engineer. He'll know how to defeat this sneaking foe.

LEBANON STEEL FOUNDRY

EXCLUSIVE AMERICAN LICENSEE
FOR GEORGE FISCHER METHOD
SCHAFFHAUSEN, SWITZERLAND



LEBANON, PENNA.

*Stainless and Special
Alloy Steel Castings*

Industrial Advertisers Meet; Prizes Awarded for Best Campaigns

FOR three days last week, more than 704 members of the National Industrial Advertisers' Association, in its 15th annual conference and exposition at the Edgewater Beach Hotel, Chicago, heard industrial advertising and sales executives discuss the solution of

problems confronting them as industrial advertisers and publishers.

Depicting all types of industrial publications, printing, engraving and photographic excellence, the use of industrial films for the transmission of a sales message, and the qualities of many other con-

cerns' services, the exhibits by 47 companies were the focal point of the meeting. One section of these displays was given over to panel presentations of recent advertising campaigns by companies that wished to enter a contest which is held each year by the association, certificates of award being given for the campaign, which, in the opinion of the jury of awards, is conspicuous for the excellence of its planning and execution.

The jury based its decisions this year upon the following points: Simplicity, copy, text, coordination, continuity, typography, layout and art, objective and results. Awards were given in each of six classifications, which, with the companies winning the awards, were:

Major installations—large power units and accessories associated therewith, processing equipment, including large furnaces, heavy machinery, etc.—first place to Fairbanks, Morse & Co., Chicago, and honorable mention to Austin-Western Road Machinery Co., Chicago, and Chicago Bridge & Iron Co., Chicago.

Accessory installations—machine tools, lifting, handling and all transportation units, pumps and compressors, small furnaces, heating and ventilating specialties, etc.—first place to Warner & Swasey Co., Cleveland, and honorable mention to Allis-Chalmers Mfg. Co., Milwaukee, and Heald Machine Co., Worcester, Mass.

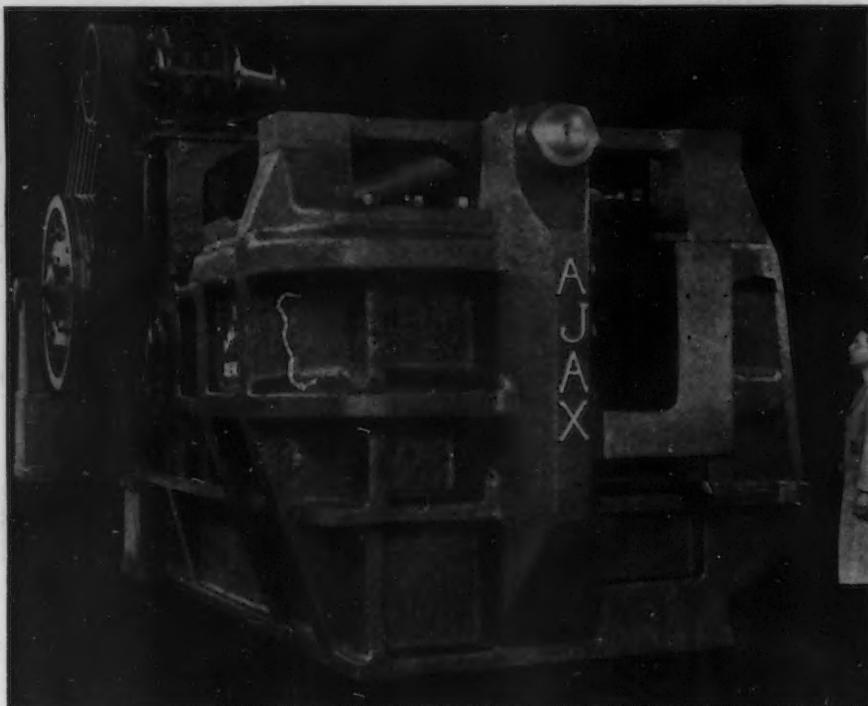
Operating equipment—portable tools, power and hand; instruments, all types; batteries; jigs and dies; electrical specialties, etc.—first place to J. R. Kearney Corp., St. Louis, and honorable mention to Manhattan Rubber Mfg. Co., Passaic, N. J., and Line Material Co., South Milwaukee.

Fabricating parts—pipes and fittings; valves, etc., hardware and fastenings, stampings, gears, bearings, etc., electrical fittings and parts, etc.—first place to Edward Valve & Mfg. Co., East Chicago, Ind., and honorable mention to Jenkins Brothers, New York, and the Mercoid Corp., Chicago.

Metals—including rolling mills, wire, alloys, smelters and refiners, castings, fabrications, warehouses, etc.—first place to American Rolling Mill Co., Middletown, Ohio, and honorable mention to Lamson & Sessions Co., Cleveland, and John A. Roebling's Sons Co., Trenton, N. J.

Materials—all non-metallic, chemicals, paints, oils, plastics, paper, lumber, leather, brick, cement, etc.—first place to Bakelite Corp., New York, and honorable mention to B. F. Goodrich Co., Akron, Ohio, and Hercules Powder Co., Wilmington, Del.

Friday morning four parallel problem clinics were conducted simultaneously in the form of round-table discussions based upon the questions asked in the program questionnaire sent to the entire membership of the association. Experts on the various questions



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under discussion conducted the clinics.

At the election of officers, Frank O. Wyse, Bucyrus-Erie Co., South Milwaukee, was made president. New vice-presidents are: Charles McDonough, Combustion Engineering Co., New York; Stanley A. Knisely, Republic Steel Corp., Cleveland; Richard P. Dodds, Truscon Steel Co., Youngstown; Theodore Marvin, Hercules Powder Co., Wilmington, Del. William D. Murphy, Sloan Valve Co., Chicago, was elected secretary-treasurer. Also elected were 32 new directors of the association, two from each of the 15 member cities, and two members-at-large.



PERSONALS..

WILLIAM G. MATHER, chairman Cleveland-Cliffs Iron Co., Cleveland, celebrated his eightieth birthday Sept. 22 and in honor of the event EDWARD B. GREENE, president of the company, entertained the directors of that company and of its affiliated holding company.



W. G. MATHER

Cliffs Corp., officers and department managers and also executives of its properties in the Northern iron ore districts, the attendance numbering about 30.

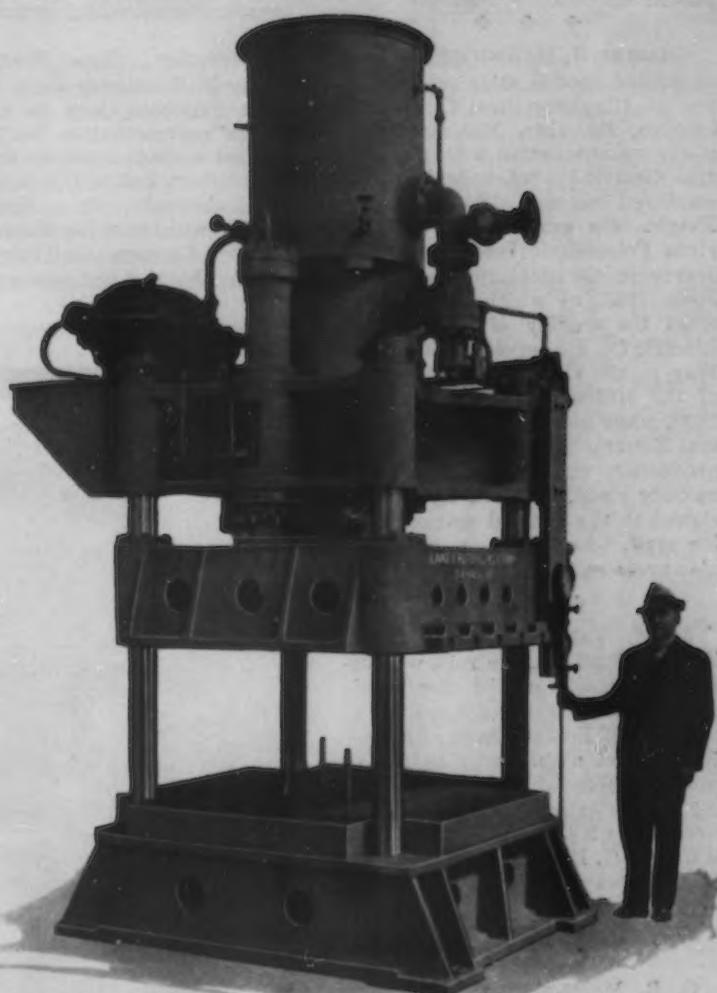
Mr. Greene was toastmaster at the banquet at which several of the executives spoke, including Mr. Mather, who entertained the guests with reminiscences. An oil portrait of Mr. Mather was presented to the company to be hung in the di-

rectors' room, the donors being officers, managers and superintendents of the company.

Mr. Mather has been affiliated with the Cleveland-Cliffs Iron Co. and its predecessor 59 years and served as its president 43 years, turning the presidency over to Mr. Greene in 1933. On his graduation from college in 1878, he became connected with the Cleveland Iron Mining Co., which was established by his father, Samuel Livingston Mather, in 1849 to develop ore

properties in Michigan. The present name was adopted in 1891 when the Cleveland Iron Mining Co. and the Iron Cliff Mining Co. were merged. After the merger and the death of his father he was made president of the new company and became one of the most prominent leaders in the iron ore, iron and steel and Great Lakes vessel industries. Still very active for his years, he continues to serve his company in a consulting capacity, but devotes the greater part of his

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Lake Erie High Speed Forming Press, 4-column type with die cushion at bottom. Self-contained pump gives high ram speed under low pressure. Columns 48" apart. Platen 72" x 72". Daylight and stroke 30". Single hand lever control. Adjustable automatic high pressure.

Here is a general purpose press that saves money on semi-production pressing and forming because it uses simple inexpensive dies and combines high speed with power, flexibility and delicacy of control. It was developed for a leading manufacturer of spiral and bevel gear cutting machinery. If you have a press problem, we offer you the benefit of our experience.

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time to the activities of philanthropic, educational and religious organizations.

♦ ♦ ♦

C. P. STAPLETON, identified with the sale of wire products since 1909, has been appointed representative for the West Coast by the Republic Steel Corp. He entered the wire selling field with the Pittsburgh Steel Co. in 1909. He transferred, in 1915, to the Keystone Steel & Wire Co., as manager of the Indiana territory, later also of Ohio and Michigan. In 1930 he was appointed Pacific Coast manager, a position he has retained until his new connection with the Republic company. He will make his headquarters at the San Francisco district sales office of Republic.

♦ ♦ ♦

CHARLES H. MCKNIGHT has been appointed special sales representative of Allegheny Steel Co., Brackenridge, Pa. Mr. McKnight formerly was connected with the General Electric Co. where he had been employed since 1912. Mr. McKnight was graduated from Virginia Polytechnic Institute with a degree in electrical engineering in June, 1912, at which time he entered the employ of the General Electric Co. He served in the World War in the Ordnance Department of the United States Army until 1920, when he returned to the General Electric Co. as assistant to the production manager in the Schenectady plant. In 1921 he was assigned to the general manufacturing staff, where he remained until his appointment at Allegheny Steel.

♦ ♦ ♦

A. W. TAYLOR, of the Rotary Electric Steel Co., Detroit, was installed recently as the new president of the Purchasing Agents' Association of Detroit. Approximately 100 Detroit manufacturing plants were represented by their purchasing agents at the installation ceremony. Other new officers are WILLIAM G. BOLEY, first vice-president; HENRY GEORGE, second vice-president, and EARL COLEMAN, treasurer.

♦ ♦ ♦

G. R. MUNSCHAUER, since 1918 president and general manager of the Niagara Machine & Tool Works, Buffalo, was the subject on Sept. 14 of a testimonial ceremony and presentation in honor of the fortieth anniversary of his connection with the company. During that time Mr. Munschauer has actively served in all divisions of the business.

♦ ♦ ♦

JOHN MCC. LATIMER, formerly identified with the Eastern Car &



C. P. STAPLETON



C. H. MCKNIGHT



A. W. TAYLOR

Construction Co., Worthington Pump & Machinery Corp. and DeWalt Products Corp. as manufacturers' representative, has been appointed exclusive representative in the western Pennsylvania territory by Lukeweld, Inc., Coatesville, Pa. He will make his headquarters in the Koppers Building, Pittsburgh. Mr. Latimer was graduated

as a civil engineer in 1918 from Lehigh University and, after service in the War, joined the Eastern Car & Construction Co.

♦ ♦ ♦

H. P. LADDS, vice-president and general manager of the Lamson & Sessions Bolt Co., Birmingham, has resigned to become president of the

MEN and VS.

WARNER & SWASEY

Turret Lathes

Cleveland



G. S. CASE, Jr.



W. M. OLSEN



G. R. NEFF



A. M. SMITH

Sweets Steel Co., Williamsport, Pa. He will be succeeded by **GEORGE S. CASE, JR.**, son of the president of the Lamson & Sessions Bolt Co., Cleveland. Mr. Case has been vice-president and general manager of the Chicago subsidiary. **WILLIAM M. OLSEN**, who has been manager of the stove bolt and machine screw sales department of the parent

company in Cleveland, goes to Chicago as vice-president and general manager of that subsidiary. **G. RIDER NEFF**, who has been identified with the company since his graduation from Western Reserve University in 1929, becomes manager of the stove bolt and machine screw sales department in Cleveland. **ALEXANDER M. SMITH**, who

was graduated from Yale University in 1932 and who has been identified with the methods and standards department of the company, has been promoted to the assistant general managership of the Chicago subsidiary.

* * *

JAMES M. KOBABE, for the past 11 years direct factory engineer for the Lee B. Mettler Co., Los Angeles, has been appointed executive general manager. **EARL E. LITZ** has been placed in charge of the Chicago office of the James M. Kobabe Co.

* * *

JAMES M. LLOYD has been appointed assistant works manager, Verona, Pa., plant of American Steel Foundries. He first started with this company in 1920 as works engineer at the company's Thurlow works, Chester, Pa. In 1926 he was promoted to assistant works manager of this plant, which position he held until 1930 when he went with the General Steel Castings Corp., Eddystone, Pa., as assistant chief engineer. In 1934 Mr. Lloyd became associated with the Tennessee Valley Authority at Knoxville, Tenn., as mechanical engineer, which position he held until his present appointment.

* * *

FRANK F. BROOKS, president, First National Bank, Pittsburgh, has been elected a director of Pittsburgh Steel Co.

* * *

F. S. SPEAR, formerly of the Stewart-Warner Corp., Chicago, has been appointed to an executive position in the Young Radiator Co., Racine, Wis., where he will supervise production of Young products being supplied to the automotive

MACHINES

IN THOUSANDS of plants today it is being demonstrated that modern Warner & Swasey Turret Lathes not only make work but also make better working conditions.

These new Warner & Swasey Turret Lathes are easier to handle, put no fatiguing strain on the operator, are safer, and enable him to maintain a high weekly wage on shorter hours.

Workmen make more with less effort, management makes more with less waste, your customers make more because you and your workmen together can give them a more accurate, better-finished product.

You can turn it better, faster, for less — with a Warner & Swasey

tractor, air conditioning and heating industries.

♦ ♦ ♦

HERMAN L. TYGESSON has joined the Kron Co. organization as general superintendent. WARNER DEFOE has been transferred to the main office in Bridgeport, Conn., as purchasing agent.

♦ ♦ ♦

CHARLES H. KEENEY, who prior to 1928 was connected with the Connecticut Blower Co., Hartford, for 18 years, has again become associated with the company as general manager and chief engineer.

♦ ♦ ♦

LAITMER KOVARIK has been appointed Pittsburgh district representative, with office at 408 South Graham Street, by the Salem Engineering Co., Salem, Ohio. PRESLEY HAMILTON, of 149 Broadway, New York, has been made New York district representative.

♦ ♦ ♦

GUSTAV LAUB, general manager of sales of the Vanadium Corp. of America, New York, has been appointed assistant vice-president and general manager of sales of the company.

C. E. NOBLE, formerly assistant metallurgist of the E. C. Atkins Co., Indianapolis, Ind., has been placed in charge of the Pittsburgh office of the Pyrometer Service & Supply Corp., Cleveland.

♦ ♦ ♦

SYDNEY W. JONES has been appointed purchasing agent of the Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., succeeding the late Adelbert G. Clark.

♦ ♦ ♦

C. A. CARRELL, who has been associated with the Acme Steel Co., Chicago, for 17 years, has been made sales representative of the company in Georgia. He will take up the sales and service duties performed by the late Hugh Duane.

♦ ♦ ♦

ROBERT K. HUNGERFORD, who has represented the Roxalin Flexible Lacquer Co., Elizabeth, N. J., for the past 12 years in New England, has been appointed sales manager of the company and will assist ALBERT MIESEM, director of sales. FRANK THOMAS and JOHN TOWART, who have received extensive laboratory and home office training, are to take over Mr. Hungerford's territory.

(CONTINUED ON PAGE 75-D)



OBITUARY...

WILLIAM G. COSTIN, chairman of the board of directors and treasurer of the Pittsburgh Screw & Bolt Corp., died Sept. 21 at his home in Pittsburgh. Mr. Costin, after a year in a clerical position with a packing concern, entered the newly-formed Pittsburgh Screw & Bolt Co. In 1899 he was made secretary, in 1903 general manager, and in 1909 president. In 1921 he was elected chairman of the board. Mr. Costin was also a member of the board of three other similar manufacturing companies and one equipment company. He was 62 years old.

♦ ♦ ♦

J. C. KAHL, manager of the Vandergrift, Pa., plant of United Engineering & Foundry Co., Pittsburgh, died Sept. 21. He was first employed in 1904 as foundry foreman and in 1913 was made assistant manager of this plant. He was promoted to the position of manager in 1916. Prior to going with United, Mr. Kahl served his apprenticeship and later acted in the capacity of assistant foreman at the Sharon works of the American Steel Foundries. He was afterward transferred by this company to its Alliance works as foundry foreman.

♦ ♦ ♦

JOHN G. RALSTON, president of the Reynolds Wire Co., Dixon, Ill., for seven years, died last week of pneumonia at the age of 59 years. Mr. Ralston had been associated with the company for 26 years.

♦ ♦ ♦

CHARLES STOLLBERG, formerly vice-president of the American Can Co., New York, died of pneumonia at his home in New York on Sept. 23, aged 77 years. He became identified with the company in 1901 at the time the Toledo Tinware Mfg. Co., of which he was head, was taken over by the American Can Co. He came to New York in 1917 to assume charge of the ammunition department and was made vice-president in charge of manufacture in 1921. He continued in that capacity until his retirement in 1933.

♦ ♦ ♦

HOWARD C. HUNT, vice-president and treasurer of the National Automatic Tool Co., Richmond, Ind., died in that city on Sept. 22 from complications following an operation for appendicitis. He was 47.



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years old and had been identified with National Automatic since 1916. He had been active in civic affairs and served as president of the Manufacturers' Association a few years ago.

♦ ♦ ♦

EDWARD H. TEALL, president and general manager of the H. P. Snyder Mfg. Co., Little Falls, N. Y., died on Sept. 9.

♦ ♦ ♦

WILLIAM BARTLETT, for 25 years superintendent of naval construction at the Brooklyn Navy Yard, died at his home at West Hempstead, L. I., aged 61 years.

♦ ♦ ♦

WHITFIELD CLARK, vice-president of the Kilby Car & Foundry Co., Anniston, Ala., died Sept. 11 of a heart attack. Mr. Clark was also president of the M. & H. Valve & Fittings Co. and was connected with other business enterprises in Anniston.

♦ ♦ ♦

GEORGE O. SEVERANCE, president of the Security Fence Co., Somerville, Mass., died suddenly at his home in Arlington on Sept. 24. He was born in Lewiston, Me., 62 years ago.

♦ ♦ ♦

WILLIAM FRANCIS GILLING, assistant manager of the Boston branch of the American Radiator & Standard Sanitary Co., died suddenly on Sept. 24 at his home in Wellesley Hills, Mass. He was 75 years old, and had been connected with the heating and ventilating business all his life.

(CONTINUED ON PAGE 75-D)

Household Products Taking More Sheets

AMERICAN ROLLING MILL CO. shipped a total of 48 per cent more sheets during the first eight months of 1937 than in the like period of 1929, W. W. Sebald, vice-president, said. Greater use of special grades for household products such as ranges and refrigerators accounted for the gain. The company also finds, he said, a growing public demand for stainless sheets and strip.

A lathe used to drill the bore of many antiquated cannon in the Confederate gun works at Selma, Ala., recently was given to Alabama Polytechnic Institute by the Tennessee, Coal, Iron & Railroad Co., subsidiary of United States Steel Corp. Saved for its historic value, the lathe has been placed on the school's campus.



—so we've been told

Even so, we don't know all about springs—but all we do know is about springs

We make springs of round wire, square wire, oblong wire; we make them to compress, to stretch, and we make torsion springs. We take flat spring steel and stamp out every conceivable shape from dies made to suit your wants.

If you use springs in quantities anywhere from one single, lonesome spring to a trillion, we will write quotations or call and discuss your springs with you. And we'll try our best to make them at a price to suit your pocketbook and in time to suit your needs.

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Dense and
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FOR USE WITH BASOLIT CEMENT

Toronto Acid Brick are designed for use with Basolit, the acid-proof cement joint. Accurate spacing buttons and end grooves insure uniform self-anchoring joints at low labor costs for laying up tank walls and

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Gear Makers Discuss Trade

A WELL balanced and substantial program, both as to commercial and technical topics, featured the twentieth semi-annual meeting of the American Gear Manufacturers Association,

held at the Spink-Wawasee Hotel and Country Club, Lake Wawasee, Ind., Sept. 20-22. Furthermore, discussion of the 10 or more formal addresses and of the several committee reports was more general

than usual, due to the extra time provided by spreading the sessions over three days, instead of two as heretofore.

There were three morning sessions, one evening session and an informal dinner. Afternoons were set aside for committee meetings and recreation. Entertainment at the dinner included a number of tenor solos by C. F. Dulotti, president, Dulotti Machinery Co., San Francisco, and several reels of interesting moving pictures by L. D. Martin, engineer, Eastman Kodak Co.

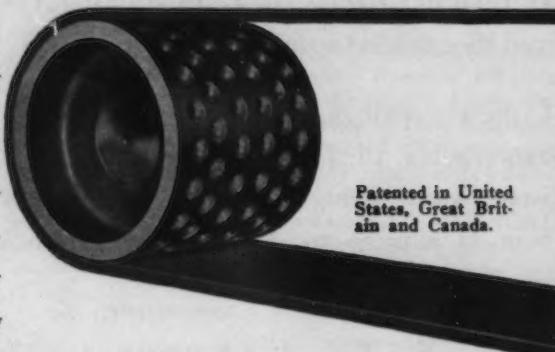
H. H. Kerr, president, Boston Gear Works, Inc., and president of the association, opened the convention and presided at most of the sessions.

Two companies were elected to membership. They are: The Perfection Gear Co., Harvey, Ill., and

This Pulley Revolutionized FLAT BELT Performance...

TEN BIG POINTS

- 1 Belt slippage eliminated.
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- 10 Vacuum Cup Pulleys never wear out.



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"A Belt Never Squealed on a Vacuum Cup Pulley"

TRIPLE COMPRESSION SCRAP BALERS



STYLE
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Also Regular
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in all sizes



H. H. KERR, president
of the American
Gear Manufacturers
Association.

the Research Laboratories Division
of the General Motors Corp.

S. L. Nicholson, who recently retired as assistant to the vice-president of the Westinghouse Electric & Mfg. Co., and who was one of the founders of the association, was made honorary life member in recognition of his counsel constructive activities in connection with the association.

Variety of Technical Papers

Of the formal addresses, six were devoted to technical topics. One of the outstanding was on the "Relation Between Microstructure and Machinability of Alloy Gear

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and Technical Topics

Steels," by Dr. N. E. Woldman, chief metallurgical engineer, Eclipse Aviation Corp., East Orange, N. J.

In the manufacture of high strength alloy gears where there are so many different machining operations, the question arises as to what quality of a certain grade of alloy steel is most suitable for satisfactory and efficient machining in all operations. Why does the steel of a certain quality machine well in the automatics, and yet machine poorly in gear cutters? Why does the steel of one structure tear in broaching, yet produce a smooth finish with the form tool?

These are questions, said Dr. Woldman, which are troubling production men, tool designers and machinists in their attempt to maintain standard machining rates and standard surface finish. The

therefore, that the structure condition of a definite alloy steel will determine its machinability rating in a definite operation in a specified

machine tool, said Dr. Woldman. Manufacture of small aircraft gearing involves automatic machining (drilling, forming, counterbor-



HOWARD DINGLE,
vice-president of the
American Gear Manufacturers Association.

plant metallurgist is called upon to solve these problems in order to minimize machining difficulties, to eliminate production delays, and to prevent any rise in machining costs.

Alloy steels, it was pointed out, can be purchased today with a fine, medium or coarse grain; hot rolled or cold drawn; full annealed for pearlitic-laminated structure, normalized for fine sorbitic structure, specially annealed for coarse open-grain spheroidized structure, or quenched and tempered for dense, close-grained spheroidized structure. They can also be obtained in any desired hardness. It is obvious,



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Grilles of unusual beauty in exclusive designs suitable for public and commercial buildings and private homes. Ornamental sheets for radiator enclosures and metal furniture are furnished of any metal. Write us for prices and samples.

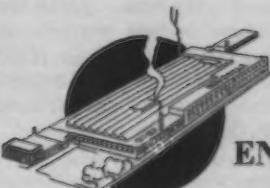
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A group of early arrivals at the 20th semi-annual meeting of the American Gear Manufacturers Association.

ing, reaming and cutting-off; broaching (rough and finish); turning; and gear cutting (rough and finish). Each operation requires a specially designed tool, made from a required alloy and heat treated to a definite hardness. It is obvious therefore that there must be some difference in the behavior of each of these different cutting tools on the one grade of steel, he continued. It is also apparent that different structures of the same steel will react differently to the same cutting tools.

Of the steels used for highly stressed aircraft gearing, Dr. Wolfman considered only the oil-hardening types, such as the S.A.E. 6150, 3250 and 4350 grades.

Each Shop Must Solve Own Problems

To compare the company's experience with that of other plants, the question: "what is the best microstructure in S.A.E. 6150, 3250 and 4350 steels for optimum machinability in the manufacture of highly stressed gearing?" was asked of the chief metallurgists of a number of automobile and steel companies. The replies, it was stated, verified the company's earlier opinion that each machine shop must solve its own machining problems in its own way, due to the fact that the practice varies with the

design and the mass of the part being machined, and also with the character and condition of the machine tools used.

Subsequent sections of the paper are devoted to machinability and its requirements; microconstituents affecting machinability; character of chips and surface finish, and a large section to experiments made by the company to definitely establish the relationship between the microstructure and machinability of the above-mentioned oil hardening alloy steels. From these experiments the following conclusions were drawn:

1. For S.A.E. 3250 and 4350 steels the quenched and tempered, fine grained spheroidized structure is best for automatic machining.
2. For S.A.E. 6150 steel the coarse grained spheroidized structure, obtained by long annealing at and about the lower critical temperature is best for automatic machining.
3. For all three steels, the laminated-pearlite structure, obtained by annealing above the upper critical temperature, is best for broaching.
4. For all three steels, the laminated-pearlite structure, obtained by annealing above the critical temperature, is best for gear cutting.
5. For all three steels, the laminated-pearlite structure, obtained by annealing above the upper critical temperature, is best for single point tool turning of the bevel faces of the gears.

6. The spheroidized structure, obtained by long annealing at and about the lower critical temperature is best for minimum distortion in hardening, the annealed laminated-pearlite structure producing the most distortion.

Torch Hardening of Gears Described

Interesting data on torch hardening were given by W. E. Sykes, Farrel-Birmingham Co., Inc., Buffalo, N. Y., in a paper on "Torch Hardening Methods for Gears."

It is the author's opinion that the torch hardening method possesses so many advantages that it is likely to be used on an extensive scale. It has the extremely important advantages of hardening gear teeth without appreciable distortion and of doing this relatively economically.

When considering this process it is desirable to bear in mind that by its use steel is heated to a somewhat high temperature and rapidly quenched and that a steel suitable for this treatment should be used, said Mr. Sykes. Up to the present non-alloyed steel containing from 0.40 to 0.60 per cent carbon seems to be suitable. Some of the alloy steels have given good results but greater care is necessary to apply the correct heat and to apply the quenching fluid at the correct dis-



Association, held last week at the Spink-Wawasee Hotel and Country Club, Lake Wawasee, Ind.

tance from the heating flame. Some steel castings containing as low as 0.30 per cent carbon with a high manganese percentage will also harden satisfactorily.

Difficult to Measure Temperature and Hardness

One of the difficulties in using the process is to gage or measure the temperature of the heated metal, he continued. Another is in correctly ascertaining the hardness of the gear tooth. In this connection it was stated: If we cannot measure the hardness or the temperature but can get good results without doing so there is no reason to discard the process pending the development of suitable instruments. In nearly all developments the method and machine came first and the instruments of measurement and verification later.

The torch hardening machine developed by the Farrel-Birmingham Co. for hardening gears which connect parallel axes was described briefly. For the hardening of bevel gears, a machine has been developed by the Gleason Co., Rochester, N. Y.

Up to the present the Farrel-Birmingham machine has been found suitable for hardening from 4 DP to 1 DP. It has been used for pitches as fine as 6 DP, but naturally for the fine pitches it is not

as satisfactory as for relatively coarse pitches. It is believed that it is practical to harden as fine as 8 DP.

It was stated that any hardness between 60 and 80 scleroscope, or 400 to 550 Brinell, can be obtained. It is, however, as important to know what is the desirable hardness for a torch hardened gear. From experience to date it does not seem desirable to obtain a hardness greater than 75 scleroscope.

Preheating Unnecessary

As to the desirability of preheating and of drawing, Mr. Sykes said that he has not found that either is necessary or desirable.

Approximately 700 pairs of gears have been hardened on Farrel-Birmingham machines. Many of the sets in operation have replaced similar gears unhardened, and the torch hardened ones were said to have shown greatly increased life and are still running satisfactorily without discernible wear. Torch hardening, it was pointed out, is also being used for hardening many other machine parts.

Pitting of Gear Teeth Studied

Experimental work on pitting was described in a paper on "Roller Tests to Determine Pitting Fatigue Strength," by Dr. Stewart Way,

Westinghouse Research Laboratories. This work is being carried out in two parts, namely, tests made with pure rolling contact, using cylindrical rollers; and tests of actual gear sets. As the title indicates, the paper discusses primarily the results of the roller pitting tests. It includes a description of the failure; and of factors influencing pitting, the latter covering materials, surface finish and lubricants. An appendix is devoted to a discussion of the stresses responsible for pitting cracks, and a hypothesis concerning the growth of the cracks.

Another fundamental contribution at the same session was the presentation by J. O. Almen, head, dynamics department, research laboratories division, General Motors Corp., of a supplement to his previous paper on "Factors Influencing the Durability of Automobile Transmission Gears." In it he describes the methods for calculating stress in helical automobile transmission gears and spiral bevel gears.

Electric Motors for Gearmotor Applications

Types of motors generally applied as a part of gearmotors or motorized speed reducers were comprehensively reviewed by L. R. Botsai, Westinghouse-Nuttall

Works, Pittsburgh, at another session.

Data were given on a.c. motors of both induction and synchronous types, the former comprising single phase, polyphase squirrel cage, and polyphase wound rotor. Discussion of the single phase motors included (1) repulsion start, induction run; and repulsion induction; (2) capacitor start, induction run; two-valve capacitor; and (3) split phase. Characteristic curves were shown, and also an application guide for single phase and fractional horsepower motors.

The squirrel cage motor, essentially a constant-speed machine, was said to be the simplest and lowest priced motor on the market. There are five general types, obtained mainly by modifications in the design of the rotor. Interesting data were given on each type and characteristic torque curves were shown.

Mr. Botsai pointed out that the starting power of induction motors should not be confused with the horsepower ratings. Some motors, for example, will start very heavy loads and bring them up to normal speed. Others have less starting ability when it comes to heavy loads, but the same motors will carry the load satisfactorily, once it is brought up to speed. This difference in ability to start certain loads is due to the class of work for which the motor is designed and not due to any lack of quality. In view of this fact, it is important to know the kind of machine or load the motor is to drive.

Amount of Current Drawn to Be Considered

The amount of current the motor will draw must also be considered, he said. Otherwise a motor that is to start a heavy load may draw so much current from the line that it will dim lights, slow down other motors, and run up the power bill.

Squirrel cage induction motors incorporating special features were also described. One is the multi-speed type, with stator winding, or windings, connected to give two, three or four different speeds.

Other sections of the paper gave brief data on wound rotor or slip ring motors, synchronous motors, and d.c. motors, shunt, series and compound wound. Modifications, principally mechanical, of standard a.c. induction and d.c. motors, to adapt them for many applications were taken up in another part. Some of these are splash proof, totally-enclosed fan cooled, totally-enclosed explosion proof and waterproof. An application guide for integral horsepower motors in

sizes from 1 to 200 hp. was included with the paper.

Surveying Community Job Values

A graphical method by which a manufacturer can compare the rate he is paying with the rates paid by other industries in the community for work requiring the same skill and efficiency was described by A. S. Crockett, General Electric Co., West Lynn, Mass., in an address on "Job Values Based on Community Survey." A single occupation (common labor) was used to illustrate how the mass of detail involved in such a survey can be arranged and analyzed.

A paper dealing with the relation of the A.G.M.A. to other associations in standardization activities was presented by T. R. Rideout, engineer, Westinghouse Nuttall

Works, and chairman of the association's technical standards committee. The paper was confined to the type of standardization activities having influences outside the scope of a trade association.

Other addresses at the meeting included "The Credit Situation," by Paul Fielden, president, National Association of Credit Men, and "Present and Pending Legislation," by R. S. Smethurst, assistant counsel, National Association of Manufacturers. At an evening session under the chairmanship of Howard Dingle, president, Cleveland Worm & Gear Co., Erik Oberg, editor *Machinery*, and John Haydock, managing editor, *American Machinist*, spoke on foreign industrial relations. These addresses were supplemented by moving pictures by Mr. Haydock.

Steel Builders Offer \$9000 For Best Elevated Highway Designs

THE steel industry last week opened a national campaign for reconstruction of the nation's highways.

It invited engineers and architects everywhere to design an elevated automobile road intended to save thousands of lives and millions of dollars in America annually.

For best designs of such a super-road, a vast potential outlet for steel, the American Institute of Steel Construction offered \$9000. Only the institute's employees are barred in a competition which provides a first prize of \$5000; second, \$2000; third, \$1000, and ten prizes of \$100 each.

Announcement of the award, to be made in six months, came from Clyde G. Conley, the institute's president, who told the organization's 100 guests at a dinner in New York that roads of the "America of tomorrow" can be lifted into air by use of steel.

Sees Many Benefits

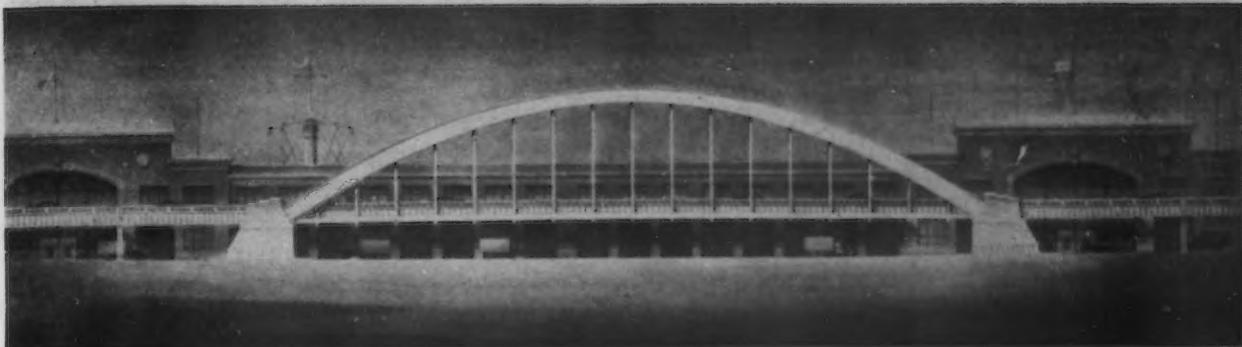
Likewise, by elevation of such highways into a great network, the nation, Mr. Conley said, can reduce traffic deaths, protect property values in cities, increase demand for automobiles and in other ways benefit an America threatened with slow strangulation by traffic congestion.

"In looking over the work our industry did last year, I find that better than 37 per cent of the tonnage of our fabricated structural shapes went into bridges," Mr. Conley told his audience.

"That great volume was made possible only by demand for more and better highways. We are now finding there is a newer and rapidly growing market which in recent



CLYDE G. CONLEY, of Mt. Vernon, Ohio, president of the American Institute of Steel Construction, which offers \$9000 in awards for best designs for an elevated highway.



DRAWING of the proposed Canal Street arch in downtown New York. The arch is part of the project extending the West Side elevated highway farther downtown, and was designed by the engineers of the Bureau of Highways and Sewers, Borough of Manhattan, New York. Construction of the arch will require 2550 tons of structural steel. The West Side highway itself is an example of an elevated roadway which the American Institute of Steel Construction sees universally used in the future in the country's large cities.

years we hardly knew existed, namely, elevated highways.

"Upon examination of this market we made some startling discoveries. We found there are many other industries interested in the problem, some of them already endeavoring to work out a solution. The automobile manufacturers have approached this from the point of view of providing greater safety to automobile users. They realize that the design of a highway is an important factor.

Markets Will Follow

"Likewise the transportation companies who are sending their freight upon the highways in constantly increasing volume, the petroleum industries which provide the fuel to drive the cars, and the engineering profession which is constantly looking for a means of expediting all industries.

"Every market has its social implications. In this it is to supply the public with a more convenient, more economical and safer means of transportation. If we are able to do that our markets will follow as a matter of course.

"Our first step therefore was to appoint a committee to study the problem from the point of view of the steel fabricator. Our committee consists of Albert Reichmann, vice-president of the American Bridge Co., Charles M. Denise of the Bethlehem Steel Co., and R. C. Mahon, of the R. C. Mahon Co. of Detroit, chairman.

Design First Essential

"We realize that design is the first essential before we can fully establish the efficiency of this type of highway and its ability to relieve

the street congestion which is getting a strangle-hold upon every city in the United States."

Citing New York's West Side viaduct as a hint of "things to come" in the transportation field, Mr. Conley found that:

"New York City is the only congested metropolis which has yet undertaken to build elevated highways.

"Put a few more cars on the streets of New York and movement will practically cease," Mr. Conley declared.

Among obstacles to reconstruction of the nation's automobile roads, the institute president listed invested capital. "The elevated railway, the surface car lines and

the railroads persist upon holding to what they have acquired," he said. "The highways have been added thereto as a sort of hybrid. To solve the problem in a scientific manner is impossible as long as there is permitted this interplay of competitive industries."

The jury which will determine the winners of the American Institute of Steel Construction's elevated road competition are Albert Kahn, architect, Detroit; Harland Bartholomew, city planner, St. Louis; Paul P. Cret, architect, Philadelphia; Loran D. Gayton, city engineer, Chicago; Paul G. Hoffman, president, the Studebaker Corp., and C. M. Pinckney, chief engineer, Borough of Manhattan, New York City.

Five Men Who Have Made Steel for 50 Years

THESE five men, each of whom can boast of 50 years of steel-making experience, were honored guests at a recent breakfast where 27 veteran employees of the Joliet, Ill., works, Carnegie-Illinois Steel Corp., were awarded service medals. Left to right in the photograph are William Isaac, who was with the company from 1875 to 1929; Thomas Perkins, who began in 1881 and retired in 1932; Cornelius Dillon, who served from 1875 to 1927; Ernest H. Jones, who began at Joliet in 1885 and is still at the plant; Timothy F. Sullivan, who was connected with the corporation from 1870 to 1931, and W. E. Hadley, general superintendent, Gary works, who presided at the service medal breakfast.



Request For Higher Freight Rates May Follow Railroad Wage Compromise

WASHINGTON, Sept. 28.—Confronted with higher labor and material costs, railroads may ask for higher freight rates and passenger fares.

The board of directors of the Association of American Railroads discussed the question of acting to overcome insufficient revenue at a meeting here Friday and it is reported that there have been informal conversations between rail executives and members of the Interstate Commerce Commission.

It is not believed, however, that petitions for higher rates, if finally filed, will be submitted until after the ICC hands down a decision in the pending general freight rate increase case (ex parte 115). A report is current that this decision will be announced soon.

Any move for higher rates probably will not be taken until after the railroads and the Railroad Brotherhoods have completed negotiations over the wage increase demand.

Yield About \$75,000,000

Even should the commission grant all increases in the pending general rate advance case, it is estimated only about \$70,000,000 or \$75,000,000 revenue annually would be produced.

The brotherhoods' demand for 20 per cent increase in wages has been met by the railroads with a counter offer of a 5 per cent increase. Assuming a compromise of 10 per cent, which may be more than the carriers will agree to, the increased wage bill would be about \$150,000,000 or more a year without further laying off of employees.

On this basis, therefore, even a full grant of advance rates requested in the general rate increase case would be only about 50 per cent of the estimated higher labor costs.

Some estimates of the compromise rail wage increase ranged as low as 6 and 7 per cent. With greater labor costs, railroads are complaining of rising material costs. Legislation likewise is a source of railroad worry.

M. J. Gormley, executive assistant of the Association of American Railroads, addressing the Railway Fuel and Traveling Engineers' Association in Chicago today, for instance, said the bill to limit the length of freight trains to

70 cars, if enacted, will increase by \$150,000,000 annually the operating costs of the railroads.

Among increased rates that it is commonly thought carriers will be granted in the pending case will be those applying to iron and steel, scrap, machinery and possibly on coke and coal, though perhaps, it

is held, less than the increases asked.

Inadequacy of revenues to meet higher materials costs and forthcoming higher labor costs is partially responsible for a let down in maintenance work and the comparatively small amount of new construction.

The view prevails here that the railroads this fall and winter will restrict to absolute necessity all new maintenance and construction operations and that policy will see further curtailment in steel demand by the carriers.

G-E Holds Industrial Heating Course

MORE than 100 power sales engineers of various electric-service companies attended the five-day course in industrial heating practices and applications sponsored by the General Electric Co. and held at Schenectady, Sept. 20-24. Comprehensive data on new types of equipment and new developments in the art were supplemented by actual demonstrations of modern heat-treating equipment at work in the G-E Schenectady and Pittsfield plants. Engineers of electric-service and other companies joined G-E specialists in presenting papers on scheduled subjects.

Topics included standard heat-treating furnaces, scale-free hardening, induction heating and melting, arc melting furnaces, steel mill furnace applications, malleable and non-ferrous annealing, furnace brazing, industrial ovens, and porcelain enameling. Also, air heating—forced and natural convection; soft metal-melting applications; liquid immersion heating; soldering irons, gluepots and cartridge units; and transformers for industrial heating. The final sessions were devoted to the origin and growth of industrial heating, and electric heat in the transportation, abrasive, coal, silk and printing industries. Time was provided at the close of the sessions for questions and answers.

The conference included a dinner meeting at the Van Curler Hotel, Schenectady, Sept. 22, at which addresses were made by E. O. Shreve, General Electric vice-president in charge of sales, and W. H. Sammis, vice-president, Commonwealth & Southern Corp.



E. O. Shreve, G-E vice-president in charge of sales, speaking at the dinner meeting of the industrial heating conference, held at Schenectady last week.

Mesta Machine Co. Has 15 Months' Work

UNFILLED orders of Mesta Machine Co., Pittsburgh, at the present time are reported to be between \$21,000,000 and \$22,000,000. On June 30 the company's unfilled business approximated \$24,000,000 while at the beginning of 1937 the figure was slightly over \$14,000,000. No cancellations of contracts have been reported and the reduction in the past three months in backlog was attributed entirely to active operation of the plant. It is estimated that nearly 15 months will be required to complete orders now on the books.

James A. Rowan Appointed News Editor

JAMES A. ROWAN, formerly of the Pittsburgh *Press*, and feature writer on industrial and labor subjects for the Scripps-Howard newspapers, has been appointed news editor of *The Iron Age*.

Mr. Rowan was graduated from Cornell University in 1924, with the degree of mechanical engineer. His practical experience as a steel mill worker, before graduation, covered a period of three years and included employment at the Sharon Steel Corp.'s Lowellville plant as chemist's assistant, at Youngstown Sheet & Tube Co., in the flexible conduit department, and as weighmaster and shipping clerk in Republic's Youngstown pipe plant.

After graduation, Mr. Rowan joined the *Brazilian-American Magazine* in Rio de Janeiro and became managing editor in 1925. During this same year he made a labor survey of Brazil for the United States Department of Labor. He joined the Youngstown *Telegram* as feature writer in 1926, becoming successively financial editor, city editor and in 1934, managing editor.

In 1936, Mr. Rowan became labor editor of the Pittsburgh *Press* and for the past year has covered labor and steel news for the Scripps-Howard newspapers, including the Pittsburgh *Press*, Cleveland *Press*, New York *World-Telegram* and also the United Press Association. He has also been the steel industry correspondent for *Wall Street Journal* from 1930 to date.

Mr. Rowan has an extensive acquaintance among the members of our industry and is nationally known for his handling of strike news in the steel industry for the Scripps-Howard publications. He was given this assignment by his publishers and covered the situations, through first hand contact, at Youngstown Sheet & Tube Co., Republic Steel Corp., Bethlehem Steel Co. and Inland Steel Co.



JAMES A. ROWAN

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Farm Equipment Makers Meet Oct. 6

A PROGRAM planned especially to appeal to every manufacturer of farm equipment and related lines has been arranged for the 44th annual convention of the Farm Equipment Institute, to be

held at the Palmer House, Chicago, Oct. 6 and 7. Implement dealers will be tendered a luncheon, and H. A. Shantz, president, National Federation of Implement Dealers' Association, will make an address. Other speakers include Dr. Glenn Frank, former president, University of Wisconsin, and now editor, *Rural Progress*; H. G. Davis, director of research, Farm Equipment Insti-

tute; C. B. Fritsche, managing director, Farm Chemurgic Council; and S. G. McAllister, president International Harvester Co.

On Oct. 5, preceding the meetings, an all-day golf party will be held at a Chicago district club. Robert A. Jones, 608 South Dearborn Street, Chicago, is secretary of the institute.

Heppenstall Strike Called Off as Company, Union Agree on Election

PITTSBURGH, Sept. 28.—The Heppenstall Co.'s plant here, closed since July 12 because of a Steel Workers Organizing Committee strike, was reopened yesterday following a conference Saturday between company and SWOC representatives and James F. Dewey, commissioner of conciliation for the U. S. Department of Labor.

Maintenance crews returned to work today, making preparations for operation of the plant. Some finishing departments are expected to be in operation shortly.

The strike settlement, covered by letters sent to Conciliator Dewey by C. W. Heppenstall, president of the company, and Philip N. Murray, chairman of the SWOC, provides for virtual resumption of the pre-strike status quo with no change in wages, hours or general working conditions, nor has any contract been signed between company and union.

Plan Election Soon

When the strike was called, negotiations were under way looking toward an election to determine whether SWOC was entitled to act as bargaining agent for the employees. The present understanding is that a conference will be held within the next 60 days, to determine on the terms of such an election. Both company and union, in letters to Mr. Dewey, promise that

there will be no coercion or intimidation of employees prior to the election.

Pending an election, the company agrees to deal with the SWOC in settlement of grievances of any of its members under the same terms as are included on this point in the SWOC's wage agreement with Carnegie-Illinois Steel Corp. A representative of the company points out that this arrangement already prevailed in the Heppenstall plant before the strike was called. Grievances of employees not members of the SWOC will continue to be handled through the same channels as were provided by the company prior to the strike.

All Reinstated

All employees are to be reinstated in their former positions as rapidly as conditions and the company's business permit. No new workers are to be employed until all those who have been on strike have been offered their positions.

Attorneys for the company arranged for a continuance to Dec. 6 of the corporation's injunction proceeding against officers and members of the SWOC, and officials of Pittsburgh and Allegheny County. Testimony of the company's side of this case had been completed when court adjourned on Friday, and was to have been resumed with appearance of defense witnesses today.

having a natural reaction in the market.

"A careful investigation of consumers' ability to buy fails to indicate a collapse in business," he added. In commenting on the labor situation, Mr. Weir stated that it is one of the big factors in loss of confidence, remarking, "Attacks of the Labor Board against industry are very bad, very disastrous."

Public Contracts Board Appointed

WASHINGTON, Sept. 28.—Secretary of Labor Frances Perkins has appointed a permanent Public Contracts Board under the Walsh-Healey Act. Named to the board are Thomas Holland, of Michigan, former NRA compliance officer for New Jersey and special Labor Relations Board attorney, as chairman; Oscar R. Strackbein, former assistant trade commissioner to Cuba and Venezuela and economic adviser to a cigar makers' union; and Maj. Robert Nelson Campbell, former NRA Construction Industry Division Administrator and more recently the Tennessee Director of the U. S. Employment Service.

Correction

REFERRING to the article on "Power Transmission Couplings" in the issue of Sept. 9, J. B. Kelley of the Falk Corp. takes issue with Mr. Jurischek on the statement (page 53) that the cylindrical spring-grid type of flexible coupling "is one of the best-known of all flexible couplings, having been made famous by the work of the great authority, Gustave Fast."

Mr. Kelley writes: "Basic credit for the centrifugal grid member type of coupling commonly identified on the American market as the Falk Steelflex Coupling, belongs to the inventor, Mr. James Bibby, of the Wellman, Bibby Co., London, England. The Falk Corp. purchased the American rights under these patents a number of years ago and has manufactured a coupling under those patents and later patents perfected in our own organization, with which Mr. Fast has never been connected."

A joint meeting of the Eastern States Blast Furnace Association and the Chicago District Blast Furnace Association will be held at the University Club, Cleveland, Oct. 15. A program of subjects to be discussed at this meeting is being prepared.

Pessimism Not Justified By Business Outlook, Says E. T. Weir

PITTSBURGH, Sept. 28.—In the opinion of Ernest T. Weir, chairman of the board, National Steel Corp., the recent decline in the stock market is being over-emphasized, as an analysis of the real business condition does not justify the extreme pessimism that is sweeping the country. It is his belief that such pessimism could lead to serious business retrogression and, if carried to excesses, might result in curtailed industry, lost jobs and reduced payrolls.

Mr. Weir said: "I hear people compare the present situation with that of 1929. That is ridiculous. The banking structure is sound; we have an excellent financial situation; there is plenty of money;

there is normal consumption of consumers' goods throughout the country; and there are excellent prospects of moderately favorable business if normal conditions are allowed to prevail."

He attributed the pessimism to the fact that some quarters expected a more than seasonal rise in business after Labor Day and when this failed to develop, stocks were sold with the result that the decline fed on itself and eventually raised fears over the general business outlook. Continuing, he said: "Back two months ago, there was little mention of the stock market. Today it is the theme of conversation everywhere. I feel that security prices advanced to a point not justified and we are now

PERSONALS

(CONTINUED FROM PAGE 68)

JOHN MAY has been elected vice-president in charge of sales of the American Steel & Wire Co., subsidiary of the United States Steel Corp. He succeeds DENNIS A. MERRIMAN, who is retiring. Mr. May, who had been assistant general manager of sales, was appointed general manager of sales of the company March 1 as successor to Mr. Merriman and it was announced at the time that the latter would remain as vice-president of the company and active in its organization until his retirement in September. When Mr. May was appointed general manager of sales headquarters were removed from Chicago to Cleveland.

Mr. May's services with the American Steel & Wire Co. began in 1909 when he was employed as a correspondent in the order department at the New York office. During that year he was transferred to Worcester, Mass., as assistant to the educational director of the company and back to the New York office as correspondent in the electrical and wire rope sales division. In May, 1910, he became a salesman in the electrical and wire rope sales division and was made assistant manager of sales in that division in 1918. He was appointed manager of electrical and wire rope sales in 1922 and in 1931 was appointed assistant general manager of sales, retaining that position until his promotion last March.

Born in Rockland, Me., Mr. May received his grammar and high school education in that city and was graduated from the University of Maine with an engineering degree in 1905. He was employed in the engineering department of the New York Telephone Co. for three years after his graduation from college and before becoming associated with the American Steel & Wire Co.

Mr. Merriman retires after 46 years of service with the company and its predecessors, having first been employed as a salesman with the St. Louis Wire Mill Co. in June, 1891. He was general manager of sales from 1927 until he was succeeded by Mr. May early this year and has been vice-president since 1928.

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DR. HEINRICH KOPPERS, 64-year-old engineer and industrialist of Essen, Germany, who as a pioneer in the chemistry of coke spurred the worldwide development of the products of coal and coal-tar, and for whom the farflung Koppers interests in the United States are

named, is returning to Pittsburgh for a friendly visit with his former associates. While here he will be guest at a luncheon given by his old associates at the Duquesne Club, Pittsburgh, with leading figures in industrial technology present, and he will visit the new building of Mellon Institute which has conducted broad coal-tar researches for many years. Dr. Koppers plans to remain in the United States for at least two weeks, during which time he expects to visit industries in Detroit, Chicago and other cities.

W. C. Snyder, Jr., Heads Lewis Foundry

W. CORDES SNYDER, JR., has been elected president of Lewis Foundry & Machine Co., Pittsburgh, a Blaw-Knox Co. subsidiary. Mr. Snyder has been as-



WILLIAM CORDES
SNYDER, JR.

sociated with the company for a number of years and was elected vice-president in 1936. His election as president fills a vacancy which has existed during the past year.

Philadelphia After N. Y. Steel Shipping

EFFORTS to win steel shipping from New York to the port of Philadelphia through deepening of the latter city's 35-ft. channel have been started by Governor George H. Earle of Pennsylvania. Declaring that Bethlehem Steel Co. and United States Steel Corp. subsidiaries formerly used Philadelphia for ore shipments, Governor Earle was to confer with United States Army engineers at Washington regarding deepening of the Pennsylvania city's harbor to handle larger vessels.

OBITUARY

(CONTINUED FROM PAGE 69)

WALT KELLER, prominent throughout the automotive industry and widely known in the Detroit area, died Sept. 28 in Henry Ford Hospital, Detroit. He was a brother of K. T. KELLER, president of Chrysler Corp., and S. T. KELLER, regional manager for Chrysler in Cincinnati. Mr. Keller for the last 17 years had been a manufacturers' representative, his firms being the Yale & Towne Mfg. Co., Aetna Ball Bearing Co. and Una Welding Co. of Cleveland. He was born in Mount Joy, Pa., 49 years ago and was graduated from the Mount Joy high school and the Williamson trade school. In 1911 at the age of 23, Mr. Keller joined the United States Navy. He became an expert on torpedo work and during the War was given a commission on the U.S.S. O'Brien. During his last illness Mr. Keller was in the hospital for six weeks. He underwent four major operations within three weeks and death followed pneumonia.

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JOHN G. BETTCHER, founder, Bettcher Mfg. Co. and of the former Cleveland Wrought Washer Co., Cleveland, died Sept. 22, aged 79 years. A native of Germany, he had resided in Cleveland since 1871. In 1899 he founded Bettcher & Co., which in 1902 became the Bettcher Mfg. Co. Five years later he sold his interest in that company and organized the Cleveland Wrought Washer Co., which later was merged with the United States Screw & Bolt Co., Cleveland. He retired in 1920.

RAILROAD BUYING

Lehigh Valley has ordered six diesel-electric locomotives from Electro-Motive Corp.

General Chemical Co. has placed an order for 90 tank cars with General American Transportation Co.

Barrett Co. is inquiring for 40 tank cars of various capacities.

Detroit Street Railway, Detroit, has purchased 250 additional Ford transit buses, bringing total number of Ford buses operated by this company up to 1081.

Texas & Pacific has applied for authority to issue \$1,275,000 in equipment trust certificates to apply on the purchase of 500 50-ton box cars from Pullman-Standard Car Mfg. Co., and 100 50-ton self-clearing hopper cars from Bethlehem Steel Co.

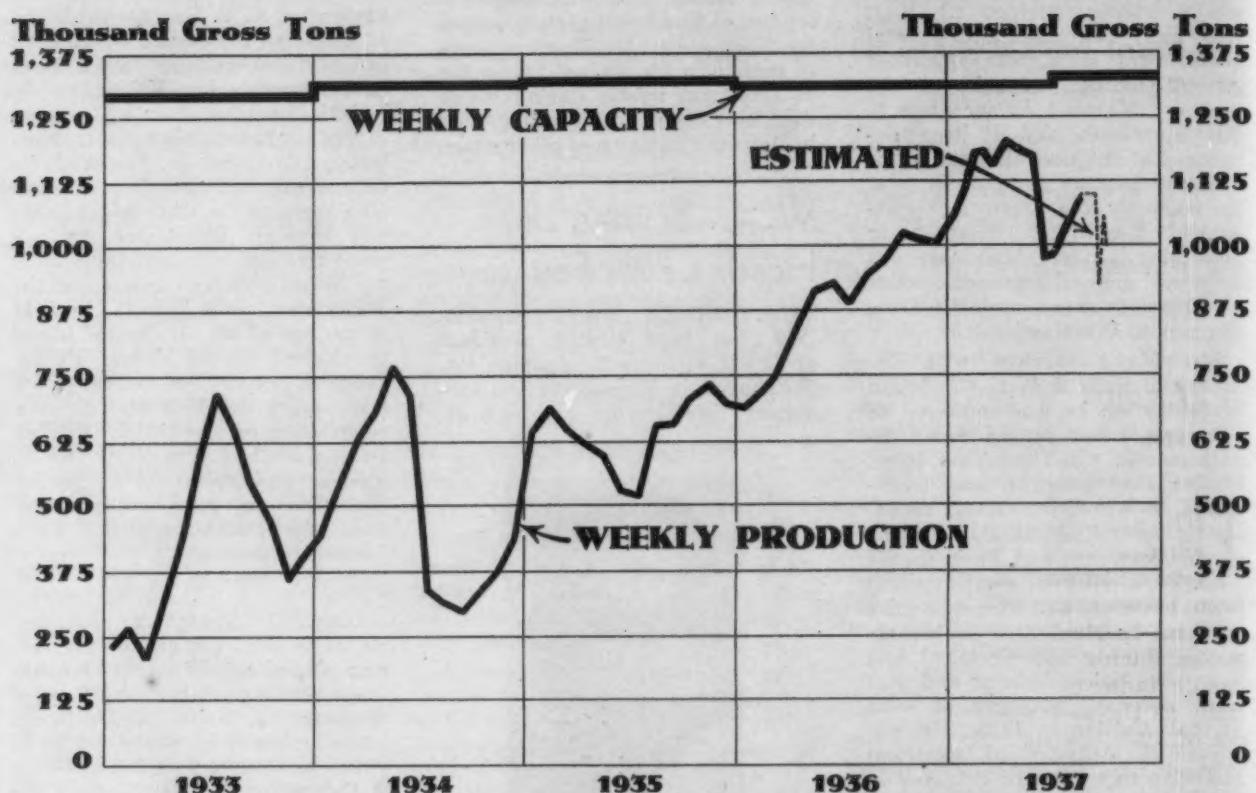
RAILS AND TRACK SUPPLIES

Denver & Rio Grande Western has ordered 13,400 tons of 112-lb. and 131-lb. rails from Colorado Fuel & Iron Co. for delivery in October, November and December. The company's rail mill was recently closed but will be reopened immediately.

New York Central has divided 5000 tons of rails among Carnegie-Illinois Steel Corp., Bethlehem Steel Co. and Inland Steel Co.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh	69.0	72.0
Chicago	76.0	78.0
Valleys	70.0	72.0
Philadelphia	63.0	65.0
Cleveland	68.0	65.0
Buffalo	79.5	79.5
Wheeling	85.0	85.0
Southern	67.0	73.5
Ohio River	76.0	88.0
Western	65.0	95.0
St. Louis	74.0	72.0
Detroit	100.0	100.0
Eastern	62.0	70.0
Aggregate	74.0	76.0

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	Sept. 28, 1937	Sept. 21, 1937	Aug. 31, 1937	Sept. 29, 1936	1937	1936
Fabricated structural steel awards.....	18,115	11,210	6,515	20,450	856,210	831,930
Fabricated plate awards.....	1,775	11,655	2,275	1,790	86,915	180,885
Steel sheet piling awards.....	0	0	0	0	41,850	42,185
Reinforcing bar awards.....	6,225	2,350	3,170	4,610	213,230	274,365
Total Lettings of Construction Steel...	26,115	25,215	11,960	26,850	1,198,205	1,329,365

...SUMMARY OF THE WEEK...

... Ingot output drops two points to 74% of capacity.

... New business makes small gains; automobile buying awaited.

... Export demand is broadening; steel scrap in further decline.

THE adjustment of the steel industry and allied units to a reduced volume of new business continues this week, but a point of equilibrium between production and incoming business may be reached within the next two or three weeks, during which time orders from the automobile industry are expected to increase materially as the motor plants swing into volume output of 1938 models.

Steel ingot production for the country as a whole is estimated at 74 per cent for this week, compared with 76 per cent last week. Of the major producing districts, the drop at Pittsburgh is the sharpest, three percentage points, with Chicago, the Valleys and eastern Pennsylvania each off two points, the South 6½ points and the southern Ohio district 12 points. A contra-trend advance of three points occurred in the Cleveland-Lorain area, where operations now average 68 per cent.

Further sharp price declines have marked the scrap situation as mills refrain from buying, and, in some instances, hold up shipments of scrap previously purchased. Steel scrap has dropped \$1 at Pittsburgh, on top of \$2 a week ago, and similar reductions have occurred at Chicago, Cleveland and Youngstown, with Philadelphia down 50c. THE IRON AGE scrap composite price is now \$17.58, only 50c. a ton above the year's low of \$17.08 in late June.

The shortage of coke, which was one of the bottlenecks during the period of maximum iron and steel production this year, has been relieved to an extent that has permitted the shutting down of about 1000 beehive coke ovens in the Connellsville region.

STEEL mill labor is beginning to feel the effects of reduced operating schedules. The first adjustment was the elimination of overtime, but in some departments hours have gone below the standard of 40 a week. Most of the large producers are attempting to stagger work, as they

did during the years of low operations, while in some smaller plants men have been laid off on a seniority basis. Car builders have laid off men in an effort to spread out their remaining work over as long a period as possible.

The steel trade is virtually a unit in the belief that the extreme caution now prevailing among their customers is being overdone; they attribute the lack of confidence largely to the recent stock market slump, together with the uncertainties as to Administration acts and policies and to labor agitation. For example, the slowness of some of the principal units of the automobile industry to buy steel in conformity with their prospective fall manufacturing programs is attributed in part to fresh labor disturbances in the Detroit area and the failure of General Motors and the United Automobile Workers' Union to reach a final agreement.

Labor's demands are largely instrumental also in the holding back of railroad buying. However, a compromise wage settlement between the carriers and the railroad brotherhoods is momentarily expected, which, if followed shortly by the increase in freight rates the roads are seeking, may pave the way for the release of many railroad inquiries that have been held in abeyance. Railroad buying has not stopped entirely, the Denver, Rio Grande & Western having ordered 13,400 tons of rails from the Colorado mill, while the New York Central has divided 5000 tons among three mills. The Virginian has ordered 7200 tons of steel for the repair of 1000 coal cars and is inquiring for 8200 tons of rails.

The building construction lag is shown by the August figures of the American Institute of Steel Construction. Orders for fabricated structural steel of 117,612 tons in that month were the lowest of the year thus far, although shipments of 158,228 tons were the highest for any month. In the New York district some speculative residential building has been abandoned because present labor and material costs are too high for the rents that can be obtained. Structural steel lettings this week were 18,000 tons.

EXPORT inquiry in large volume from Europe, principally Great Britain, offers fresh promise, although buyers are attempting to obtain concessions from domestic prices, which American mills have been quoting for export. A sale of 25,000 tons of semi-finished steel to Britain was made at less than \$37, Pittsburgh, the domestic price. Recent British offers, which may indicate the amount of the concession, were at \$34, Pittsburgh. Considerable business probably will be negotiated if American mills meet the price ideas of the British, but American steel pays a 12½ per cent duty in Britain against 2½ per cent on steel from the Continent.



... Ingot output declines to 69% in Pittsburgh district.

... New steel bookings show little, if any, change.

... Steel scrap declines \$1 a ton; beehive coke output curtailed.

PITTSBURGH, Sept. 28.—Ingot output in the Pittsburgh district has declined three points this week to 69 per cent of capacity, while the Wheeling district remains unchanged at 85 per cent. The curtailment is still attributable to the conforming of output to incoming business.

Total bookings during the past week showed little, if any, change from the previous period. Semi-finished steel and wire demand picked up some and there was a slight improvement in structural plate and shape specifications. On the other hand, sheet sales were somewhat below the previous week's, and no perceptible increase has appeared in strip steel bookings.

Producers are still pinning their hopes on a better volume of business from automotive makers and in many cases do not expect substantial support from miscellaneous sources for at least a month.

Specifications appear to be spotty both in regard to companies and products. Some companies report sales so far this month to be below those booked during the corresponding August period, while other producers continue to show a moderate improvement.

Virginia Railway has allocated steel for its car repair program covering 1000 coal cars requiring approximately 7200 tons of material. This road is inquiring for 8200 tons of rails.

The raw material markets are soft with No. 1 heavy melting steel quotable at \$17.50 to \$18, off \$1 a ton.

Close to 1000 beehive coke ovens have been taken out of operation during the past week.

tract No. 2, Queens, N. Y. Nicholas DiMenna is general contractor for contract No. 3 of the same project, involving 2000 tons of bars. Quite a few jobs are pending and are expected to be let some time soon. Reinforcing bar bookings are coming in at a good rate. Prices to contractors remain unsteady. It is estimated that jobbers' stocks in the East are unusually large.

Plates and Shapes

The majority of structural inquiries and awards involve privately financed projects. American Bridge Co. has been awarded a contract involving 1100 tons of material for public school No. 252, Brooklyn. Plate and shape specifications in the past week increased somewhat over the previous period, with plates in better demand than shapes. Virginian Railway has allocated steel for its repair program involving rebuilding of 1000 120-ton coal cars. Orders for 1700 tons of fabricated parts have been placed with several car builders. The balance of the material, approximately 5000 tons, will be fabricated at Virginian shops.

Sheets

Sheet buying during the past week was somewhat below the volume placed in previous periods. The small showing was undoubtedly due to lack of automobile buying, as miscellaneous demand has been dull for some time. Producers are still hopeful that automotive purchases will increase and that at least a partial resumption of miscellaneous buying will materialize. Backlogs are fairly well depleted and deliveries of two to three weeks or less on various grades of sheets are obtainable.

Tin Plate

Pressure for delivery has subsided some. With the deadline on shipments coming this week, tin plate operations are estimated at 96 to 100 per cent, as quite a few producers have dispensed with overtime and are now working the normal 15 turns a week. A further decline in operations is expected next month. Export inquiry is not as active as it was several weeks ago. New business for fourth quarter delivery is coming in at a fair rate.

Wire Products

Total wire sales have again shown improvement, with the major increase being in the manufacturers' wire category. Improved demand in this item is traceable to better automotive and miscellaneous activity. While the anticipated heavy jobber buying has not materialized yet, total bookings for

Pig Iron

New business continues spotty, with some customers placing moderate-sized orders. Shipments and production are still at recent levels. Jobbing foundries are not as busy as a few months ago but sanitary ware activity is exceptionally good. Some producers are successfully building up stocks.

Semi-Finished Steel

Current demand compares favorably with recent weekly averages and if anything shows a slight increase. Buying by non-integrated mills is slightly better and some pick-up has been noticed in demand for forging billets, due undoubtedly to forge shops receiving better releases from automobile makers.

Bars

Specifications during the past week are no better than the previous period and most producers can give fairly prompt deliveries ranging from 10 days to two weeks on tonnage items. Some non-integrated mills appear to have ample stocks for the time being. Jobber buying is spotty and involves fill-in sizes and grades.

Cold Finished Bars

New business in the past week has been unimpressive and if anything was below the volume booked a week ago. Largest consuming interest continued to be the automotive industry. With the latter purchasing periodically, the trend in bookings continues irregular. Jobbing and warehouse business is slow.

Reinforcing Bars

Jones & Laughlin Steel Corp. is expected to furnish 2500 tons of bars for a sewer project No. 2, con-

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

	Sept. 28	Sept. 21	Aug. 31	Sept. 29
Per Gross Ton:	1937	1937	1937	1936
Rails, heavy, at mill	\$42.50	\$42.50	\$42.50	\$36.37 1/2
Light rails, Pittsburgh	43.00	43.00	43.00	35.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	32.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	32.00
Slabs, Pittsburgh	37.00	37.00	37.00	32.00
Forging billets, Pittsburgh	43.00	43.00	43.00	39.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	40.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.05
Bars, Chicago	2.50	2.50	2.50	2.10
Bars, Cleveland	2.50	2.50	2.50	2.10
Bars, New York	2.78	2.78	2.78	2.40
Plates, Pittsburgh	2.25	2.25	2.25	1.90
Plates, Chicago	2.30	2.30	2.30	1.95
Plates, New York	2.53	2.53	2.53	2.19
Structural shapes, P'gh	2.25	2.25	2.25	1.90
Structural shapes, Chicago	2.30	2.30	2.30	1.95
Structural shapes, New York	2.5025	2.5025	2.5025	2.16 1/4
Cold-finished bars, P'gh	2.90	2.90	2.90	2.35
Hot-rolled strips, P'gh	2.40	2.40	2.40	1.95
Cold-rolled strips, P'gh	3.20	3.20	3.20	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.60
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.70
Sheets, Galv., No. 24, P'gh	3.80	3.80	3.80	3.20
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.30
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	1.95
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.05
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.55	3.05
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.65	3.15
Wire nails, Pittsburgh	2.75	2.75	2.75	2.05
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.10
Plain wire, Pittsburgh	2.90	2.90	2.90	2.50
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.55
Barbed wire, galv., P'gh	3.40	3.40	3.40	2.55
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.60
Tin plate, 100 lb. box, P'gh	\$5.35	\$5.35	\$5.35	\$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

Sept. 28, 1937
One week ago
One month ago
One year ago

2.605c. a Lb.
2.605c.
2.605c.
2.197c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

	HIGH	LOW
1937	2.605c. Mar. 9: 2.330c. Mar. 2	\$22.25, Mar. 9: \$20.25, Feb. 16
1936	2.330c. Dec. 28: 2.084c. Mar. 10	19.73, Nov. 24: 18.73, Aug. 11
1935	2.130c. Oct. 1: 2.124c. Jan. 8	18.84, Nov. 5: 17.83, May 14
1934	2.199c. Apr. 24: 2.008c. Jan. 2	17.90, May 1: 16.90, Jan. 27
1933	2.015c. Oct. 3: 1.867c. Apr. 18	16.90, Dec. 5: 13.56, Jan. 3
1932	1.977c. Oct. 4: 1.926c. Feb. 2	14.81, Jan. 5: 12.56, Dec. 6
1931	2.037c. Jan. 13: 1.945c. Dec. 29	15.90, Jan. 6: 14.79, Dec. 15
1930	2.273c. Jan. 7: 2.018c. Dec. 9	18.21, Jan. 7: 15.90, Dec. 16
1929	2.317c. Apr. 3: 2.273c. Oct. 29	18.71, May 14: 18.21, Dec. 17
1928	2.286c. Dec. 11: 2.217c. July 17	18.59, Nov. 27: 17.04, July 24
1927	2.402c. Jan. 4: 2.212c. Nov. 1	19.71, Jan. 4: 17.54, Nov. 1

Pig Iron

\$23.25 a Gross Ton
23.25
23.25
18.73

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	LOW
1937	\$23.25, Mar. 9: \$20.25, Feb. 16	\$21.92, Mar. 20: \$17.08, June 15
1936	19.73, Nov. 24: 18.73, Aug. 11	17.75, Dec. 21: 12.67, June 9
1935	18.84, Nov. 5: 17.83, May 14	12.42, Dec. 10: 10.33, April 23
1934	17.90, May 1: 16.90, Jan. 27	13.00, Mar. 13: 9.50, Sept. 25
1933	16.90, Dec. 5: 13.56, Jan. 3	12.25, Aug. 8: 6.75, Jan. 3
1932	14.81, Jan. 5: 12.56, Dec. 6	8.50, Jan. 12: 6.42, July 5
1931	15.90, Jan. 6: 14.79, Dec. 15	11.33, Jan. 6: 8.50, Dec. 29
1930	18.21, Jan. 7: 15.90, Dec. 16	15.00, Feb. 18: 11.25, Dec. 9
1929	18.71, May 14: 18.21, Dec. 17	17.52, Jan. 29: 14.08, Dec. 3
1928	18.59, Nov. 27: 17.04, July 24	16.50, Dec. 31: 13.08, July 2
1927	19.71, Jan. 4: 17.54, Nov. 1	15.25, Jan. 11: 13.08, Nov. 22

Steel Scrap

\$17.53 a Gross Ton
18.25
20.17
16.75

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

this type of business are slightly better than previous weeks.

Strip

New business is no better than a week ago. Automobile tonnages are small and miscellaneous demand is only fair. Producers are still pinning their hopes on better purchases by automobile parts makers.

Tubular Products

Oil-country goods specifications have declined slightly during the past week. Some producers are able for the first time in several months to begin replenishing their almost negligible stocks. It is estimated that it will take some mills one to two months to bring their inventories up to a normal level, hence pipe production as far as oil-country goods is concerned, will not suffer much of a setback.

Coal and Coke

Beehive furnace and foundry coke demand continues exceptionally dull. During the past week or so close to 1000 beehive coke ovens have been taken out of operation. Plants which are still producing have reduced their working schedule to such an extent that many of them are on two days a week.



... Farm implement industry still operating at good rate.

ST. LOUIS, Sept. 28.—The agricultural implement trade continues the brightest spot in consumption of pig iron in the St. Louis area. In the Tri-Cities, there seems to be no letup in operations, two plants operating with three shifts and most of the others with two shifts. Farmers have money with which to buy improvements for the farm, and the trade believes they will thus spend it, with the result that the present rate of operations is expected to continue throughout the remainder of 1937. The same is true of the tractor trade in Peoria.

The melt of pig iron in the stove industry is improving, and the plants in Belleville are operating on a five-day schedule, although not at a full production rate. Jobbing foundries in the St. Louis industrial district are enjoying better

business. Shipments of pig iron for September are expected to show a slight increase over August. Buying is on a spot basis.

Ingot production remains at 68 per cent of capacity.

Buying of finished steel continues light. Consumers bought heavily earlier in the year before prices advanced, and they feel their stocks are ample until there is a spurt in buying of finished products. Lack of railroad buying is also a deterrent factor.

Foster & Creighton Co., Nashville, Tenn., is low bidder on the Marine Hospital to be built near here, requiring 325 tons of reinforcing bars and 140 tons of structural shapes. Bids are due Oct. 1 for a highway bridge to be built in Clinton County, Ill., requiring 750 tons of structural shapes. The St. Louis Ship Building & Steel Co. has been awarded 300 tons of plates for pontoons for the United States Engineers' office at Memphis, Tenn.



... Producers see pig iron shortage by 1938; pressure for finished steel deliveries continues.

ONDON, Sept. 28. (By Cable)— August production was reduced by holidays and makers are endeavoring to catch up on deliveries, hence an increased shortage of pig iron is envisaged by the end of the year and buyers are now anxious to place contracts up to May but producers are not inclined to commit so far ahead.

No Cleveland foundry or basic pig iron is offered, but small parcels of hematite are available for early delivery.

Semi-finished output is increasing but Continental deliveries are well behind quota and rerollers are operating under difficulties. A further parcel of 15,000 tons of Continental sheet and tin plate bars has been negotiated.

Pressure on finished steel deliveries is unrelaxed and there are some complaints that industrial work is restricted by Government demands. Export business is quiet.

Tin plate demand is moderate. Export sales include South America, Australia and the Continent.

There are inquiries from Canada. Output at 77 per cent is outstripping bookings. Unfilled orders are under 6,000,000 base boxes. Export quotations have eased. Black and galvanized sheets are quiet.

International Thin Sheet Cartel reduced Continental prices for Ireland by 5s. and abolished rebate of 5s. for Dutch East Indies.

The Continental steel market is quiet, dominated by Far East crisis and an autumn revival is expected. Japan bought 1000 tons of Continental foundry iron at 101s., f.o.b., for quick shipment.



...PIPE LINES....

Shell Pipe Line Corp., Shell Building, St. Louis, a subsidiary of Shell Petroleum Corp., same address, has authorized new welded steel pipe line from recently opened Roxana, Ill., oil field to Indianapolis, about 260 miles, for crude oil transmission. Pumping stations will be installed along route for booster service. Cost about \$3,000,000.

Gulf Cities Natural Gas Co., Silsbee, Tex., plans welded steel pipe line from gas field, about seven miles from municipality, to municipal limits, for natural gas transmission.

Valley Pipe Line Co., McAllen, Tex., has let contract to Dobbs & Dobbs, Sullivan City, Tex., for about 16 miles of 5½-in. welded steel pipe from oil field at Samfordyce, Tex., to Port Isabel, Tex., for crude oil transmission to terminal station of Coastal Refineries, Inc., at latter place. Award for pipe has been made to Republic Steel Corp. Cost close to \$100,000.

Humble Pipe Line Co., Houston, Tex., a subsidiary of Humble Oil & Refining Co., same address, plans about 14 miles of 4-in. welded steel pipe from recently opened oil field at Avoca, Jones County, Tex., to connection with main pipe line from Bluff Creek oil area, Shackelford County, for crude oil transmission. Pumping station will be installed for booster service. Cost about \$100,000. Company also plans new 24-in. welded steel pipe line from Dickinson oil field, Galveston County, Tex., to Houston, for crude oil transmission to refinery of parent company at Baytown, on Houston ship channel.

Gulf Pipe Line Co., Houston, Tex., a subsidiary of Gulf Oil Corp., same address, plans about 26 miles of 8-in. welded steel pipe from Sand Hill oil field, Crane County, Tex., to connection with main pipe line between Crane City and Midland, Tex., for crude oil transmission. Booster stations will be installed along route. Cost close to \$200,000. Main offices of companies are in Gulf Building, Pittsburgh.

Phillips Petroleum Co., Bartlesville, Okla., has let contract to J. R. Stewart Co., 1156 North Denver Street, Tulsa, Okla., for welded steel pipe line from Liberal, Kan., where connection will be made with booster pumping station of Panhandle Eastern Pipe Line Co. to LaVerne, Okla., connecting with main line of company from Berger to Bartlesville.

Bureau of Reclamation, Denver, asks bids until Oct. 8 for three 120-in. dia. steel penstocks for power plant at Seminoe, Wyo., and for two 72-in. dia. steel outlet pipes for outlet works at Seminoe dam. Kendrick project, Wyo. (Specifications 975-D).

Texas-New Mexico Pipe Line Co., Hobbs, N. M., plans welded steel pipe line from oil field at Jal, N. M., to Crane, Tex., for crude oil transmission. Cost over \$70,000, with booster pumping stations.



CHICAGO

... *Some miscellaneous consuming lines show pick-up in buying.*

... *General situation still dull, however, as mills await larger automobile tonnage.*

... *Pig iron presents brighter picture than steel; backlog large.*

CHICAGO, Sept. 28.—A continuation of the decline in orders for steel in this district has resulted in a two-point drop in operating schedules to 76 per cent of capacity, three mills being affected.

In spite of the curtailment in mill activity, more optimism is apparent this week among sellers than at any time in the past month. One large producer reports sales and specifications last week as being up to the average for the past six or eight weeks. All sellers are expecting to benefit considerably, either directly or indirectly, from automotive releases. Forgers, whose business at present is only fair, are looking forward to increased activity around the first of the month when orders for 1938 cars are expected. A reversal of the current tendency of backlog to decline is anticipated in several lines, notably sheets, bars and strip, when motor car assemblies once more begin to rise.

Farm equipment manufacturers continue to produce at capacity, and mills report the receipt of releases for shapes, plates, sheets, strip, bars and wire from this source regularly. Orders are greatly improved from a miscellaneous group of consumers. For instance, a roller skate manufacturer recently purchased a large quantity of bolts, and laminating jobbers, who produce radio parts, expect to be busy through January at least. Stove makers announce an increase in business, and, although one has a large stock of sheets on hand, it expects to enter the market again sometime during the fall,

as the farm trade is counted on to buy heavily late in the autumn. Jobbers are beginning to add to their stocks, feeling that the fall will bring an increased demand for their items. Automobile accessory makers are actively engaged in production for 1938 models. A manufacturer of ironing machines reports good business, as does a maker of dump-truck bodies, who states that the showing of new truck models has added to his sales.

Structural fabricators, generally, are well occupied, although mostly with small jobs. Sales and orders for shapes and plates were reported for last week by one company as being 50 per cent greater than in the previous week.

The picture has its share of blue aspects, and prominent among these is the fact that railroad orders are running low and car builders are beginning to spread available work in an effort to make it last until some new orders are received. Men are being laid off in shops where car repairs are under way and buying for this purpose is following a downward curve.

Mills are reluctant to see business go elsewhere, and, as a result, are watching carefully for each new inquiry lest a competitor beat them. Few lines, if any, can boast of a backlog of orders which is not declining, and shipments are now available in two to three weeks or less on almost any type of material. In some mills, where considerable overtime work has been allowed, the trend is toward a straight 40-hr. week, and it is

understood that some departmental managers are worried over their ability to provide even that much work. In other cases, certain mill departments are running fewer days a week.

Pig Iron

Sellers of pig iron are optimistic over prospects for the duration of this year and 1938. Current sales are not large, but order books are well filled and will extend in most cases to the end of the year. Some uncertainty exists in the trade because of the upset conditions in political and security circles, but revamping of many foundries is underway and considerable money is being spent, so that foundry operators appear to see a bright spot in the future which will make profitable for them their current expansions and improvements. Automobile foundries are busy, but few have reached their peak activity yet.

Wire and Wire Products

Sellers of wire, for many weeks the most optimistic of all steel salesmen for good business in the fall and 1938, are more cheerful than ever this week, and after looking at all phases of their business, can see nothing, provided the political and financial picture does not change appreciably in the next quarter, to mar their bright outlook for the remainder of this year. Reports received from automobile centers are encouraging, and, in spite of advancing automobile prices, indicate that record sales are expected by the motor car manufacturers. Makers of automobile springs and other items requiring the use of wire are reported to be anxious about available deliveries because of heavy production schedules which are about to be started. About two weeks is sufficient time to get out almost any order. Outside salesmen report low jobbers' stocks. Widespread moves to replenish these supplies have not yet begun, but sellers are anticipating such action at any time.

Bars

An increase in automotive specifications is looked for within the next two weeks, at which time a lengthening of the two to three weeks delivery now being quoted is expected.

Plates

Backlogs are being further depleted each week, and unless railroad, pipe line or structural demand improves considerably soon, this market will soon be deep in the doldrums. Even tank work

has fallen off lately, the greatest current demand being for structural purposes. As car shops find themselves nearing the end of their orders, the work is being stretched out to last as long as possible, and men are being laid off.

Structural Shapes and Reinforced Bars

Awards and inquiries are light this week both in shapes and bars. The only two shape awards of any consequence went to Hansell-Elcock Co. No inquiries of more than 100 tons have been reported. Reinforcing steel activity is likewise small. The future holds promise for several jobs, none of which is definite at the moment, but when plans are completed will require some good tonnages of bars.

Sheets

Releases are not yet being received in large volume from the automobile industry and sheet backlog are still declining. Specifications from makers of stoves, refrigerators and various types of farm implements are coming in regularly but this tonnage is not sufficient to cause an increase in unfilled orders. Sheet sellers are confident that October will bring a renewal of interest from motor car manufacturers.



...Steel orders decline; operations also lower.

CINCINNATI, Sept. 28.—With automobile manufacturers all but absent from the market, finished steel demand declined last week to about 55 per cent of capacity. Although miscellaneous business is moving at fair rate, mill operators report evidence of slackening in this broad field. Since backlog were reduced in anticipation of a brisk fall demand, district mills have reduced operations to an average of about 75 per cent. The Zanesville unit of the leading district interest is exceptional at 100 per cent, but others are from 60 to 80 per cent active.

Ingot steel production followed finished steel downward to about 76 per cent the latter part of the past

week. Schedules for this week place open hearth operation at 74 per cent. Production shrank the past week from 30 open hearths to 26 out of 34, while this week the active total is 25.

Interest in new pig iron commitments has waned. New business is in small quantities, obviously for immediate use. Shipments also tend to be easier. The melt is about 50 per cent.

equipment. Excavation and foundation work is 85 per cent complete, principal buildings and structures, 57 per cent complete; auxiliary buildings, 55 per cent complete, and two batteries of coke ovens are 85 per cent complete.

The new mill will have an annual capacity of 200,000 gross tons of finished tin plate. This tonnage will require 589,000 gross tons of ore, 535,000 gross tons of coal, 73,000 gross tons of dolomite, and 26,000 gross tons of limestone—a total of 1,223,000 gross tons of raw materials.

One of the two batteries of coke ovens has been completed and was placed in operation this week. The other is expected to be in operation within a few weeks. Each will have a capacity of 1100 tons of coke per day.

All units of the tin plate mill will be motor driven, requiring a total of 125,000 connected horsepower.

The new project will provide employment for approximately 2500 persons.



...Market sluggish with fall farm buying slow to develop.

BIRMINGHAM, Sept. 28.—In-galls Iron Works has booked 1465 tons of structural steel for the new plant of the Aluminum Ore Co. at Mobile.

Dixie Metal Products Co., of Birmingham, is building a new plant at Bessemer, Ala. This company manufactures sheet steel products.

The steel market is still sluggish, as fall farm buying is slow to develop. Cotton conditions are affecting demand for wire products and sheets. Instead of stocking heavily at this time, jobbers are cautious and in many instances are letting their stocks run down. Active buying is not anticipated for some weeks yet.

Furnaces report heavy bookings for the fourth quarter. Most foundries have covered for at least part of their needs. September shipments have been somewhat better than those of August.

Blast furnace operations are unchanged, with 17 stacks active. Last week eight open hearths operated at Fairfield, four at Ensley and six at Gadsden. This week a total of 17 is scheduled.

The Gulfsteel division of Republic Steel Corp., at Gadsden, expects to be housed in its new office building Oct. 1.

Construction on the Tennessee Coal, Iron & Railroad Co.'s tin-plate mill development is estimated to be 60 per cent complete, and the present estimated date of operation is April 1. Contracts have been placed for virtually all of the



...Markets on coast are unusually quiet.

SAN FRANCISCO, Sept. 27.—Plans and specifications have been completed and a call for bids will be issued this week for the construction of 9400 lin. ft. of 60-in. steel Sunset Discharge pipeline between the Sunset Reservoir and 7th Avenue, San Francisco. The project will involve more than 1000 tons of steel. In Los Angeles plans soon will be complete for the remaining 14 miles of the Metropolitan Aqueduct distributing line from 98th Street to a reservoir in the Palos Verdes hills.

A program of flood control works designed to protect the entire Gila Valley, Ariz., has been submitted to the U. S. Engineer Corps at Safford, Ariz. If carried out, the development will cost in excess of \$16,500,000.

Awards last week were few and no lettings of more than 100 tons were announced. The market all along the Pacific Coast has been inactive during the past three weeks.



... CLEVELAND ...

... Operations turn upward in Cleveland-Lorain district, down at Youngstown.

... Volume of buying disappointing as recent gains are not maintained.

... Steel mill labor affected by slowing down of mill schedules.

CLEVELAND, Sept. 28.—Ingot output in the Cleveland-Lorain district turned upward this week to 68 per cent of capacity, a gain of three points. In the Youngstown district there was a two-point decline to 70 per cent.

The recent volume of new business was not maintained the past week, there being a falling off in the demand for nearly all products. The decline in orders was due in part to almost total absence of new business in sheets and strip from the motor car industry. However, several of the automobile companies are expected to purchase considerable steel within the next week or two to cover their November requirements, lists of which are now being made up.

While steel business this month has been disappointing, the volume has been somewhat better than in July and August. Many consumers still have fair stocks and some consumer plants have curtailed operations so that their inventories are not being depleted as rapidly as a few weeks ago. With good deliveries and uncertainty as to the trend in business during the remainder of the year, buyers are placing orders only for early requirements.

Backlogs in most steel products have been reduced almost to the vanishing point and operations of finishing mills have been cut down. Some plants are depending on influx of orders from day to day to maintain their present schedules. This curtailment, affected by temporary shutdowns of plants or departments or putting mills on one or two instead of three turns, is being felt by steel plant labor, the men's hours during the week being

reduced as well as the amount in their pay envelopes.

Following declines in the Pittsburgh district, scrap prices have been marked down from \$1 to \$1.50 a ton in the Cleveland and Youngstown districts.

Pig Iron

Good releases for October shipment have come from motor car foundries and the increase in the demand from this field may more than offset a falling off in specifications from other sources. September shipments by a Lake furnace interest will show a decline of about 9 per cent from August. Schedules of foundry coke shipments for the coming month are larger than for September. While new buying is light, some producers have well-filled order books for the fourth quarter. The least favorable side of the pig iron picture is a marked slowing down in the demand from foundries making heating equipment and sanitary ware, due to the slump in building activities and reduced operations by some of the jobbing foundries.

Sheets and Strip

The improvement in demand that was in evidence early in the month is not being maintained, a drop in the volume of new business during the past week being reported by most producers. This is partly due to absence of orders the past week from motor car manufacturers, who, during previous weeks this month, had purchased small lots for new models. However, several automobile builders are reported to be preparing to make new purchases within the next week or two to cover their November produc-

tion requirements and these should represent much larger tonnages than have been purchased so far for 1938 models. Miscellaneous demand is light. Some manufacturers in the household equipment field have slowed down production and many miscellaneous consumers are reported to still have good stocks.

Bolts and Nuts

Business in these products in September did not reach the volume expected at the start of the month and was about 10 per cent less than in August. The industry is operating at about 60 per cent of capacity. Business has come from the motor car industry in fair volume this month and orders from the agricultural implement manufacturers continue good. However, little business is coming from jobbers, who are reported to still have good stocks, and railroads are ordering very sparingly.

Bars, Plates and Shapes

New demand for hot rolled bars continues very dull, although one or two mills report a slight gain in orders from forge shops making automobile parts. However, not much business is expected from this source until the forge shops secure releases from motor car plants. Bolt and nut manufacturers are supplying some bar tonnages, but rivet manufacturers have enough steel in stock to last them several weeks. Activity in the construction field has subsided, there being no awards or inquiries of any size. However, fabricators are getting a fair number of small jobs requiring 50 tons or less of steel. Plates are very dull and local mills are operating from hand to mouth.



... Pig iron market fairly active; steel operations unchanged.

BUFFALO, Sept. 28.—The slow-down which has been apparent the past few weeks in other markets has so far had very little effect on pig iron. For this commodity, the market remains strong, demand good. Foundries in the main have continued their buying, some substantial commitments having been made by Buffalo makers during the past week. They report that customers are satisfied to pay

the price asked. Most producers' order books are remaining ahead of their shipments.

Few structural steel or reinforcing bar fabricated jobs were placed during the week, but fabricators are interested in a sizable school building program which will soon be available for bidding throughout western New York. To be constructed this fall will be 12 school buildings. Most of the plans will provide for reinforced slabs part way, eight with structural frames the remainder using steel joists.

A Buffalo structural concern will fabricate 100 tons of steel to be used in a remodeling job at the new plant of the Morrison Steel Products Co., Buffalo, which has recently purchased a former lithographing company plant.

Open hearth operations remain the same, with Bethlehem's Lackawanna plant at 25; Republic at five and Wickwire-Spencer at two.



...Awards of 6225 tons —2900 tons in new projects.

AWARDS

State of Connecticut, 210 tons, two State bridges, to Concrete Steel Co., Boston.

State of Connecticut, 400 tons, Merritt highway bridges, to Truscon Steel Co., Youngstown.

New York, 100 tons, paving, Henry Hudson bridge, to Truscon Steel Co., Youngstown.

Queens, N. Y., 2500 tons, sewers, project No. 2, contract No. 2, to Jones & Laughlin Steel Corp., Pittsburgh, through Tully & DiNapoli, contractors.

Montour Falls, N. Y., 200 tons, Pennsylvania Railroad grade elimination, to Igoe Bros., Newark, N. J.

Richmond, Va., 275 tons, city warehouse, to Virginia Steel Co., Richmond, Va.

Toledo, Ohio, 130 tons, factory building for Libbey-Owens Glass Co., to Hausman Steel Co., Toledo.

Detroit, 2400 tons, pumping stations and grit chambers, sewage disposal plant, S. A. Healy Co., contractor, to Carnegie-Illinois Steel Corp.

NEW REINFORCING BAR PROJECTS

Deer Isle, Me., 280 tons, bridge.

Gloucester, Mass., 350 tons, State fish pier.

New York, unstated tonnage, Canal Street arch, West Side elevated highway; bids to be received by president, Borough of Manhattan.

Queens, N. Y., 2000 tons, sewers, project No. 2, contract No. 3; Nicholas DiMenna, general contractor.

Chautauqua County, N. Y., 150 tons, grade crossing elimination.

Morris County, N. J., 250 tons, highway project.

Upper Darby, Pa., 100 tons, F. W. Woolworth Co. store.

Detroit, 275 tons, grade separation on Seven Mile Road and John R Street.

Detroit, 100 tons, sewage regulation chambers, group No. 4.

Chicago, 875 tons, Wesley Memorial Hospital.

Chicago, 150 tons, Brinks Express Co.

Waukesha, Wis., 100 tons, court house.

St. Louis, 325 tons, Marine Hospital; Foster & Creighton Co., Nashville, Tenn., low bidder on general contract.

Denver, 122 tons, railroad underpass and approaches; bids Oct. 4.

Denver, 170 tons, four bridges; bids Oct. 1.



...Pig iron buying for fourth quarter fails to develop.

BOSTON, Sept. 28.—September pig iron sales to domestic consumers will fall short of furnace expectations, and fourth quarter buying in volume has failed to develop. Quite a few foundries heretofore on a five-day week schedule are now operating only three days, and it is quite certain further curtailment will take place during the next few weeks. Foundrymen in practically every instance say there has been a sharp decrease in business. The 10,000-ton lot of iron earmarked for England has not been closed, and several other foreign inquiries are more or less up in the air. Prospective foreign buyers have suddenly taken exceptions to prices asked by furnaces, which have been considerably above the domestic market. However, several hundred tons of iron left here the past week for Rotterdam.



Boston will shortly award a tonnage of 6 to 48-in. pipe.

Portland Water District, 16 Casco Street, Portland, Me., has taken under advisement bids for 6000 ft. of 6-in. pipe and 17,000 ft. of 8-in. for North Windham, Me.

Colchester, Conn., has been granted a PWA allotment of \$88,940 for waterworks.

Groesbeck, Tex., plans about three miles of 10-in. for main water line; also smaller pipe for distributing lines and 150,000-gal. elevated steel tank and tower. Cost about \$70,000. Hawley, Freese & Nichols, Capps Building, Fort Worth, Tex., are consulting engineers.

Houston, Tex., is considering report and recommendations for extensions and improvements in municipal waterworks, including 24-in. line to Port Houston for main water supply, about 200 miles of pipe lines for extensions and replacements in distributing system; elevated steel tanks and towers at six different locations with gross capacity of 4,000,000 gal.; new high-lift motor-driven pumping machinery and auxiliary equipment with capacity of 3,000,000 to 12,000,000 gal. per day; three suction storage tanks with capacity up to 5,000,000 gal., new reservoir and other waterworks installation. Cost about \$4,000,000.

Elwood, Kan., plans pipe lines for water system; also other waterworks installation, including steel standpipe. Cost about \$46,000. Bond issue of \$26,500 has been voted and remainder of fund will be secured through Federal aid. Paulette & Wilson, National Reserve Building, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Pomona, Kan., has called special election Oct. 9 to approve bonds for \$25,000 for pipe lines for water system and other waterworks installation, including elevated steel tank. Fund will be increased to \$35,000 through Federal aid. Paulette & Wilson, National Reserve Building, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Seattle, Wash., plans 67,000 ft. of 8-in. cast iron pipe, and 6300 ft. of 2-in. galvanized steel pipe for extensions in water system on Ninth Avenue South, including service connections, hydrants, fittings, etc. Fund of \$211,000 has been secured through Federal aid. N. A. Carle, City-County Building, is city engineer.

San Diego, Cal., will take bids Oct. 26 on 245 tons for a water supply pipe line.

Railroads On Way Back, Shippers Told

PITTSBURGH, Sept. 28.—Railroads will continue to be the mainstay of the nation's transportation service but may go into Government ownership within 25 years unless public opinion prevents it, members of the Allegheny Regional Advisory Board were told here.

The speaker, Dr. C. S. Duncan, economist of the American Association of Railroads, told the shipping organization that the railroads are regaining some traffic lost to other forms of transportation and anticipate that demands for transportation will increase during the next quarter of a century faster than the population.

He warned against continued use of the railroads as "social reform laboratories" and against continued political interference that lifts operating costs. If controlling factors in treatment of the railroads remain social and political rather than economic, the carriers are headed for Government ownership, he said.



... NEW YORK ...

... Steel buying shows only a slight improvement.

... Many users still have good-sized stocks.

... Export inquiry active; Britain buys 25,000 tons semi-finished.

NEW YORK, Sept. 28.—Steel business is certainly no worse than it has been in recent weeks, and in some respects improvement has been noted, although it is still too slight to be convincing evidence of a trend toward sustained betterment. However, one large seller on Monday received the largest volume of orders by mail it has received on any one day in three weeks and other offices are able to report small gains in their aggregate bookings for the past week. September orders were slightly better than those of August.

In canvassing their trade steel salesmen find that a good many customers have fairly good stocks. Some consumers report that they have enough to last through the fourth quarter at their present rate of consumption, while others are in a less well-stocked position, but in many instances there are stocks sufficient for at least a few weeks. Replenishment buying may be somewhat slow under present conditions of caution to get underway in volume.

Tin plate production probably will continue at a fairly good rate through the fourth quarter. The producers whose plants were affected by strikes still have incomplete contracts to fill at the old \$4.85 price, but meanwhile other companies have booked a fair amount of new business at \$5.35 which they will soon be shipping. Before the end of the quarter it is expected that the can companies will place some anticipatory orders for delivery early in 1938.

A substantial volume of export inquiry is in the market, mostly from Europe, and some business has resulted, but negotiations are not so speedily concluded as they were a few months ago. Foreign buyers, having noted the recession

in operations and new domestic buying in this country, are inclined to look for concessions in prices. This is particularly true of British buyers of semi-finished, who are restricted by the fixed prices prevailing in Great Britain on finished steel products. About 25,000 tons of semi-finished steel has been bought here within the past few days at a concession from the domestic price of \$37, Pittsburgh. Just how much this concession amounts to has not been stated, but recent offers from Britain were equivalent to about \$34, Pittsburgh, or \$3 a ton below domestic prices. Some mills have turned down proffered business at prices below domestic quotations. It would appear from current negotiations that a considerable volume of business in semi-finished steel could be done with British mills if American mills were willing to meet their price ideas. However, some American exporters contend that if Britain needs our steel a change in its duties should be made; the tariff on steel from the Continent is only 2½ per cent against 12½ per cent from the United States.

Pig Iron

The fight between the CIO and AFL for jurisdiction over foundries in the Newark district has resulted in shutting down a number of plants and deliveries of iron to that area have been seriously curtailed. Melting activity outside the Newark section is comparatively unchanged. As far as new business is concerned, there has been no noticeable change in buying sentiment. New orders continue light, consisting mainly of small lots for prompt delivery. Barge shipments have been in large volume of late and will probably continue so until Nov. 1, the date on which insurance on wooden boats will expire. Export interest

is dormant. Several 5000-ton inquiries are still out, but in view of past experience little hope is felt that any of these will result in actual ordering unless concessions from current quotations are offered, and apparently sellers are not disposed to grant these concessions. The current dullness of the export market is being credited in part to the easing of the supply position abroad, particularly in England, where furnaces are reported quoting closer delivery dates than at any other time this year.

Sheets and Plate

There has been no noticeable pickup in sheet business, and large commitments are being withheld. New orders are averaging about 50 per cent of normally expected volume, according to several sellers. Sheet backlog and delivery promises are about holding their own, and the view is expressed that when automotive tonnages are placed in real volume and backlog climb, other buyers will immediately follow suit. Specialty grades of sheet are by far the more active, the chief dullness being found in galvanized sheets. Although mills are not adhering strictly to the Oct. 1 deadline and will in some instances accept business up to the end of this quarter for shipment at their option, with the functional allowance intact, practically no business is being attracted on this basis. Jobbers are well stocked and are still receiving sheets on orders placed as long ago as April. There will be little incentive for them to buy before the end of the year. Besides, the building trades, chief outlet, have sunk to an extremely low level of activity as a result of rapidly rising costs, particularly those of labor. A number of apartment house projects have been abandoned, simply because the costs would have made them unrentable. Airconditioning, mostly of the commercial type, is furnishing the chief outlet for galvanized in the warehouse trade, and city, State and Federal projects furnish the bulwark of heavy construction activity. The plate market is featureless. No outstanding activity of any kind is reported, and the immediate outlook is not promising. Railroad activity is lacking.

August Auto Output 405,064 Units

WASHINGTON, Sept. 28.—Production of automobiles in the United States and Canada in August aggregated 405,064, according to the Bureau of Census. For the eight months ended August production totaled 3,737,289.



PHILADELPHIA . . .

... Operations off two points to 63 per cent.

... Consumer caution continues to hamper steel sales.

... Scrap yard strike prevents drastic price weakness.

PHILADELPHIA, Sept. 28.—The recent wave of uncertainty which has traveled through the security and commodity markets has made all steel consumers very cautious, and this caution in turn is exerting considerable influence on the outlook for the steel industry over the remainder of the year. Many steel users, who actually need steel, are delaying purchases or buying hand-to-mouth merely because they have no way of knowing what may result from the current feeling of pessimism. In addition, considerable building is being held in abeyance until a better period for financing develops.

Despite all these negative factors, however, many members of the steel fraternity here are not overly despondent. Most mills report September business slightly in excess of the August volume, but still considerably under the total necessary to maintain current operations. One large producer seems to be enjoying much better support than the market as a whole, as this particular firm reports that the week's orders were the best for many weeks and the business in prospect quite satisfactory. All mills point to the maintenance of deliveries on old orders and the absence of cancellations as encouraging factors in the present picture; there is a general realization that automobile tonnage will expand considerably over the next month, and if railroads secure a rate increase such action will probably be followed by good steel purchases.

So far there is little or no stocking of semi-finished steel in this territory. However, the depletion of backlogs has influenced two producers to take off open hearths, and the district rate is consequently down two points to 63 per cent of capacity.

The scrap market is practically inactive in the absence of mill demand, but a major factor prevent-

ing any serious price drop is a strike of yard workers. The normal preparation of about 1000 tons of scrap daily in the metropolitan area is consequently at a standstill. The strike will probably continue for a week or so, and thus there is little likelihood of any distress scrap accumulating to depress prices.

Pig Iron

Sellers are getting some scattered carload orders, but in aggregate the new demand for iron is far below expectations. The saving factor of the situation, however, is the excellent deliveries on old orders, which are going forward in sufficient volume to prevent any noticeable build-up in furnace stocks. Nonetheless, these old orders are running out, and additional support from consumers will have to be forthcoming within the near future if stocking is to be avoided. A factor to be taken into account, however, is that several district furnaces are badly in need of repairs, and probably will be blown out as soon as current backlogs are liquidated. Foundry activity in this area is at a comparatively satisfactory level, and it seems that a better volume of orders must necessarily develop within the next month. There is some consumer talk about lower iron prices for first quarter, or even some cutting over the latter part of the last quarter. However, furnace operators scout all such rumors, and point to possible increases in freight rates and corresponding increases in costs, which will discourage such action even if demand should fall to a low level.

Plates and Shapes

Building activity in this territory continues to be very poor, and fabricators are naturally figuring very close on every new job up for bidding. As a result, price pressure transferred back to the mills, but so far quotations on plain

shapes are holding very firm. The only new shape projects up for figuring are two State bridges, one in Bradford County requiring 150 tons, and one in Bucks County requiring 100 tons; bids on both are due Oct. 8. The Anthracite Bridge Co. will furnish 1300 tons of shapes for a coal breaker at Scranton, Pa. The 450 tons for an Upper Darby grade school should be placed tomorrow, and McCloskey & Co. will soon award 4500 tons for the Philadelphia Court House. Plate business is at a low ebb, and mills will soon have to secure more tonnage or curtail operations. There is some miscellaneous ordering, but large buyers are conspicuously absent. Railroads are laying off workers by the thousands and buying no steel whatsoever, and undoubtedly will not reverse these trends until their wage and rate problems are settled. New York Shipbuilding Corp. will soon launch several boats, but still has no new tonnage to fill the ways thus made vacant. Although all mills are very anxious for plate tonnage, there is still no indication whatsoever that any producer is willing to shade quotations to secure what little business there is in the current market.

Sheets and Strip

Deliveries on all classes of material is possible within a normal two-weeks period. All mills are running on old tonnage to a great extent, with new business in the aggregate now averaging about 60 per cent of shipments. Mills are expecting much better support from the automobile industry, and miscellaneous outlets such as tanks, refrigerators, radios, and stoves, but demands from these sources are not accumulating at the pace that was predicted a month ago. Now that mills are able to meet the most exacting delivery demands on new business, quite a bit of the district's miscellaneous tonnage is being shifted from jobbers and warehouses directly to the mills, the result being very slow turnover for the former and a volume of high-cost low-profit business for the latter.

Imports

The following iron and steel imports were received here during the past week: 1500 tons of chrome ore from Philippine Islands; 998 tons of pig iron from British India; 154 tons of sponge iron, 36 tons of steel forgings, 66 tons of steel tubes, 5 tons of steel billets and 31 tons of steel bars from Sweden; 15 tons of steel bars, 5 tons of steel bands and 47 tons of structural shapes from Belgium; and 5 tons of structural shapes from France.



...NON-FERROUS...

... Domestic copper quotations down one cent.

... Two \$5 reductions bring lead down to 6c., New York.

... Backlogs protect spelter position.

NEW YORK, Sept. 19.—Following the low quotations established on export metal abroad, the general lack of consumer interest in the domestic market and the persistent stock market declines of the past few weeks, the non-ferrous metals

market developed unusual weakness over the week-end and quotations on copper, lead and tin were revised downward. The backlog of 90,053 tons and the bought up position of consumers have served to bulwark the spelter position against the factors influencing the declines in the other metals.

Copper is now quoted at 13c. per lb., Connecticut Valley, and demand, as evidenced by sales for the month through Saturday of only 19,385 tons, is very quiet. The previous quotation of 14c. had been established on April 29, after prices had advanced to as high as 17c. from the 13c. level of February.

Lead

The reduction of \$5 per ton on Friday was the first visible indication of the weakness of the non-ferrous market. This movement was followed by a second reduction on Monday to the present level of 6c. per lb., New York. August statistics show a decrease in stocks of 7585 tons to 103,518 tons, the lowest point reached this year. Shipments were 54,551 tons, as compared with 47,727 tons in July, indicating that although new buying is scarce, actual consumption is continuing at a good rate.

Zinc

Buyers have withdrawn from the market, pending the settlement of the current market uncertainties, and sales of prime Western for the week amounted to only 928 tons. Deliveries totaled 5008 tons, causing undelivered stocks to recede to 90,153 tons. Sales are still made on the basis of 7.60c. per lb., New York, but until buying is resumed at normal levels this price must be considered purely nominal. Quotations in London this morning were 4.40c. per lb., or about 6.50c. duty paid, Gulf ports.

Tin

Quotations declined in sympathy with the other metals and were down as low as 57.625c. per lb., New York, on Monday. This morning a slight reaction moved the price up to 57.875c., which is 1.875c. below the price of a week ago. The successive declines acted to draw out independent consumers who bought heavily at the lower levels. On first call in London today, cash standards were quoted at £258 15s., and three months' delivery at £253 10s.

American Rolling Spends \$2,000,000

APPROXIMATELY \$2,000,000 will be spent for improvements to the American Rolling Mill Co.'s Butler, Pa., plant, George M. Verity, chairman of the company, has announced. He told a Butler community celebration of the company's tenth anniversary in Butler that it now employs 3000 men at the Butler plant compared with 1650 in 1927.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 22	Sept. 23	Sept. 24	Sept. 25	Sept. 27	Sept. 28
Electrolytic copper, Conn.*	14.00	14.00	14.00	14.00	13.00	13.00
Lake copper, N. Y.	14.125	14.125	14.125	14.125	13.125	13.125
Straits tin spot, New York	59.625	59.125	58.00		57.625	57.875
Zinc, East St. Louis.	7.25	7.25	7.25	7.25	7.25	7.25
Zinc, New York.	7.60	7.60	7.60	7.60	7.60	7.60
Lead, St. Louis.	6.35	6.35	6.10	6.10	5.85	5.85
Lead, New York.	5.50	6.50	6.25	6.25	6.00	6.00

*Delivered Connecticut Valley; price 1/4c. lower delivered in New York.
Aluminum, virgin 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 18.25c. a lb., prompt, f.o.b., New York.
Antimony, American, 17.25c. per lb., prompt shipment, New York.
Quicksilver, \$90.00 to \$92.00 per flask of 76 lb.

Brass ingots, commercial 85-5-5-5, 13.25c. a lb., less carload, delivered; in Middle West 1/4c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	58.75c. to 59.75c.
Tin, bar	60.75c. to 61.75c.
Copper, Lake	14.00c. to 15.00c.
Copper, electrolytic	14.00c. to 15.00c.
Copper, castings	13.75c. to 14.75c.
*Copper sheets, hot-rolled	21.75c.
*High brass sheets	19.75c.
*Seamless brass tubes	22.50c.
*Seamless copper tubes	22.625c.
*Brass rods	16.25c.
Zinc, slabs	8.75c. to 9.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	18.00c.
Lead, American pig.	7.00c. to 8.00c.
Lead, bar	8.00c. to 9.00c.
Lead, sheets, cut	10.00c.
Antimony, Asiatic	20.00c.
Alum, virgin, 99 per cent plus	22.50c. to 24.00c.
Alum, No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, 1/2 and 1/4	34.00c. to 35.00c.
Babbitt metal, commercial grade	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	61.625c.
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Tin, bar	63.625c.
Copper, Lake	15.00c. to 15.25c.
Copper, electrolytic	15.00c. to 15.25c.
Copper, castings	14.75c. to 15.00c.
Zinc, slabs	8.75c. to 9.00c.
Lead, American pig.	6.50c. to 6.75c.
Lead, bar	10.00c. to 10.50c.
Antimony, Asiatic	19.25c.
Babbitt metal, medium grade	25.25c.
Babbitt metal, high grade	65.625c.
Solder, 1/2 and 1/4	39.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	10.375c.	11.125c.
Copper, hvy. and wire	9.75c.	10.25c.
Copper, light and bottoms	8.75c.	9.00c.
Brass, heavy	5.625c.	6.25c.
Brass, light	4.50c.	5.25c.
Hvy. machine composition	8.50c.	9.00c.
No. 1 vel. brass turnings	7.00c.	7.50c.
No. 1 red brass or compos. turnings	8.25c.	8.75c.
Lead, heavy	5.00c.	5.375c.
Cast aluminum	12.25c.	13.25c.
Sheet aluminum	13.25c.	14.75c.
Zinc	4.00c.	4.375c.



IRON AND STEEL SCRAP

... All markets show declines of 50c. to \$1 a ton.

... Composite price falls 67c. to \$17.58.

SEPT. 28.—As a result of the continued unwillingness on the part of mills to make any large commitments, but on the basis of small tonnage sales made into consumption, practically all markets have declined 50c. to \$1 a ton. At Youngstown, No. 1 steel and bundles are off \$1.50, as shipments continue to be restricted. The price for No. 1 steel at Pittsburgh is now quoted at \$17.50 to \$18, low point of the year, off \$1 from last week and 50c. below the previous low touched in middle June when THE IRON AGE composite touched its low of \$17.08. It now stands at \$17.58 as a result of concurrent declines of 50c. at Chicago and Philadelphia. There the situation is confused by strikes in local yards, and the temporary shortage created has resulted in a higher quotation for No. 1 than at Pittsburgh.

Pittsburgh

The market has exhibited further softness following the sale of No. 1 steel last week into consumption at \$19. Brokers making the sale were able to cover at \$18.50. Within the past two days a moderate tonnage of No. 1 steel has been sold into consumption at \$18 a ton and a small part of this order has already been covered at \$17.50. With the exception of this one buy, the market is extremely quiet, with an independent producer's embargo on shipments still in effect. No. 1 heavy melting steel becomes quotable at \$17.50 to \$18, off \$1 a ton from last week's price. Within the past week some railroad scrap has been sold "off list" at \$18.50, bringing \$19 a ton delivered Pittsburgh. Other open-hearth and blast furnace grades have declined somewhat on the basis of both sales and sentiment. The greatest drop occurred in machine shop turnings owing to a substantial sale of production material which brought \$13 delivered. Railroad specialties and low phos. grades are off somewhat following recent sales.

Chicago

A local mill has bought 5000 tons of No. 1 steel scrap at \$17, but otherwise the local market is extremely dull. Brokers' bids during the week went as low as \$16. A sale of railroad steel was made at \$16.58, de-

livered. In view of the \$17 sale, the quotation this week is \$16.50 to \$17, whereas otherwise it might have been shown as \$16 to \$16.50. This is a decline of 50c. from last week; other grades have declined in the same amount. In spite of the lowering market a feeling of pessimism and fright among dealers and brokers is conspicuously absent. Material is not being flooded into this center, as is usually the case in such a fast-dropping market, and many dealers are not even particularly anxious to sell, feeling certain that a change in conditions will be seen soon.

Philadelphia

A widespread listless situation here is reflected in an arbitrary markdown of from 50c. to \$1 for practically every item on the list, although in no instance have there been any definite mill sales to test the lower price levels. Despite the current adverse sentiment regarding fall steel-making prospects, there is no demoralization in the scrap situation so far. The absence of any distress material and the recent strike of scrap yard workers are two factors tending to support sentiment, and there is little doubt that the slightest change in the steel-making outlook would quickly find a corresponding upward change in scrap quotations. Strikes have closed all Philadelphia scrap yards, thereby bringing to a halt the preparation of 1000 or so tons of material these yards normally handle each day. Quite probably the strike will last for at least a week longer, thus working some hardship on the several district mills which draw supplies directly from the metropolitan area. For this reason, the 4000 tons of Budd bundles being bid in this week may bring a higher price than would normally be the case.

Cleveland

Prices on nearly all grades have declined \$1 a ton, the reductions reflecting the recent sharp slump in quotations in the Pittsburgh district. Heavy melting steel and hydraulic bundles are down \$1.50 a ton in Youngstown. Small lot sales have been made to a Cleveland consumer on the basis of the new quotations. Shipments to Youngstown district mills are still sharply restricted. Brokers are buying little scrap, as they were well covered against outstanding orders before the last price decline.

Buffalo

At least one sale of No. 1 heavy melting steel and No. 2 heavy melting steel was made at \$18 and \$16, respectively. The amount involved in this purchase was 1000 tons, but other smaller lots are said to have been sold at the same prices. Otherwise the market is quiet.

Cincinnati

The scrap market is definitely dull. Dealers are sitting back waiting developments, bringing general inactivity. Dealers' bids are down further with reports of No. 1 heavy melting steel purchasable at \$15. Shipments on old contracts are being made, but completion of these is not far distant.

Boston

Additional price recessions have occurred. Prices for domestic deliveries are largely nominal because of a lack of business. The one exception is steel turnings, sales being made at \$7.95 a ton on cars, contrasted with \$8.45 to \$8.70 a week ago. From Jan. 1 to Sept. 16, inclusive, 174,803 tons of scrap were exported from Boston, of which 76,685 tons went to Japan and 39,142 tons to Italy. These figures do not include partial lots shipped in vessels of regular freight lines.

New York

Domestic demand is practically nil, and at least one broker is refusing to make any offers without a mill sale to cover. In keeping with other markets and in view of this lack of consumer demand, the market is definitely softer and prices are off 50c. Material being received by mills on old orders is being given extra rigid inspection, and brokers are being asked to make concessions on reputedly sub-grade material. Even export material, which has shown much greater strength right along, has followed the general trend, and offers for both No. 1 and No. 2 steel are down 50c. Prices are holding firm on cast grades for export. Material is coming out freely to fill the last cartel purchase of 250,000 tons, making over 750,000 tons sold since the formation of the group.

St. Louis

The scrap iron market in St. Louis continues to decline, melting grades being off from 25c. to 50c. a ton, as compared with the preceding week. Lack of buying from the steel mills, weakness in other markets and freer offerings from the country have combined to make a weak market here.

Detroit

In the face of extremely sharp declines in scrap quotations, the Detroit market area this week sees the issuance of lists totalling nearly 70,000 tons. Virtually all large producers in the automotive section of Michigan are offering scrap. At the same time scrap consumers are reported out of the market. Dealers in many cases have contemplated making no offers, their attitude being a reflection of the general apprehension since the break in the Detroit market became apparent the middle of last week.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:
No. 1 hvy. mltng. steel. \$17.50 to \$18.00
Railroad hvy. mltng. 18.50 to 19.00
No. 2 hvy. mltng. steel. 16.00 to 16.50
No. 2 RR. wrought. 17.50 to 18.00
Scrap rails 18.50 to 19.00
Rails 3 ft. and under 22.50 to 23.00
Comp. sheet steel 17.50 to 18.00
Hand bundled sheets 16.00 to 17.00
Hvy. steel axle turn. 16.00 to 16.50
Machine shop turn. 12.50 to 13.00
Short shov. turn. 13.50 to 14.00
Mixed bor. & turn. 13.50 to 14.00
Cast iron borings 13.50 to 14.00
Cast iron carwheels 19.50 to 20.00
Hvy. breakable cast. 15.00 to 15.50
No. 1 cupola cast. 19.00 to 19.50
RR. knuckles & couplers 22.50 to 23.00
Rail coil & leaf springs 22.50 to 23.00
Rolled steel wheels 22.50 to 23.00
Low phos. billet crops 22.50 to 23.00
Low phos. sh. bar. 22.00 to 22.50
Low phos. punchings 21.00 to 21.50
Low phos. plate, hvy. 23.00 to 23.50
Low phos. plate clips 20.50 to 21.00
Steel car axles 23.00 to 23.50

PHILADELPHIA

Per gross ton delivered to consumer:
No. 1 hvy. mltng. steel. \$18.00 to \$18.50
No. 2 hvy. mltng. steel. 15.50 to 16.00
Hydraulic bund., new. 17.50 to 18.00
Hydraulic bund., old. 13.50 to 14.00
Steel rails for rolling. 23.00 to 23.50
Cast iron carwheels. 20.00 to 20.50
Hvy. breakable cast. 18.00 to 18.50
No. 1 cast. 20.00 to 20.50
Stove plate (steel wks.) 15.50 to 16.00
Railroad malleable. 19.00 to 20.00
Machine shop turn. 13.00 to 13.50
No. 1 blast furnace. 12.00 to 12.50
Cast borings. 12.00 to 12.50
Heavy axle turnings. 15.50 to 16.00
No. 1 low phos. hvy. 23.50 to 24.00
Couplers & knuckles. 24.00 to 24.50
Rolled steel wheels. 24.00 to 24.50
Steel axles. 27.00 to 27.50
Shafting. 23.50 to 24.00
No. 1 RR. wrought. 20.00 to 20.50
Spec. iron & steel pipe. 16.00 to 16.50
No. 1 forge fire. 16.00 to 16.50
Cast borings (chem.). 14.50 to 15.00

CHICAGO

Delivered to Chicago district consumers:
Per Gross Ton
Hvy. mltng. steel. \$16.50 to \$17.00
Auto. hvy. mltng. steel, alloy free. 1500 to 15.50
No. 2 auto. steel. 13.00 to 14.00
Shoveling steel. 16.50 to 17.00
Hydraul. comp. sheets. 15.50 to 16.00
Drop forge flashings. 13.50 to 14.00
No. 1 busheling. 15.50 to 16.00
Rolled carwheels. 20.75 to 21.25
Railroad tires, cut. 20.25 to 20.75
Railroad leaf springs. 20.25 to 20.75
Steel coup. & knuckles. 19.75 to 20.25
Axle turnings. 15.75 to 16.25
Coll springs. 21.75 to 22.25
Axle turn. (elec.). 16.75 to 17.25
Low phos. punchings. 20.25 to 20.75
Low phos. plates, 12 in. and under. 19.75 to 20.25
Cast iron borings. 9.75 to 10.25
Short shov. turnings. 10.50 to 11.00
Machine shop turn. 8.50 to 9.00
Rerolling rails. 19.50 to 20.00
Steel rails under 3 ft. 19.50 to 20.00
Steel rails under 2 ft. 20.00 to 20.50
Angle bars, steel. 19.50 to 20.00
Cast iron carwheels. 17.75 to 18.25
Railroad malleable. 17.75 to 18.25
Agric. malleable. 14.75 to 15.25

Per Net Ton

Iron car axles. \$24.25 to \$24.75
Steel car axles. 24.25 to 24.75
No. 1 RR. wrought. 14.25 to 14.75
No. 2 RR. wrought. 14.75 to 15.25
No. 2 busheling, old. 7.25 to 7.75
Locomotive tires. 17.25 to 17.75
Pipes and flues. 11.75 to 12.25
No. 1 machinery cast. 13.25 to 13.75
No. 1 railroad cast. 12.75 to 13.25
No. 1 agric. cast. 11.75 to 12.25
Stove plate. 10.25 to 10.75
Grate bars. 10.75 to 11.25
Brake shoes. 10.75 to 11.25

YOUNGSTOWN

Per gross ton delivered to consumer:
No. 1 hvy. mltng. steel. \$18.50 to \$19.00
Hydraulic bundles. 17.50 to 18.00
Machine shop turn. 14.00 to 14.50

CLEVELAND

Per gross ton delivered to consumer:
No. 1 hvy. mltng. steel. \$17.50 to \$18.00
No. 2 hvy. mltng. steel. 16.50 to 17.00
Comp. sheet steel. 17.00 to 17.50
Light bund. stamplings. 13.00 to 13.50
Drop forge flashings. 16.50 to 17.00
Machine shop turn. 11.50 to 12.00
Short shov. turn. 13.00 to 13.50
No. 1 busheling. 16.50 to 17.00
Steel axle turnings. 14.00 to 14.50
Low phos. billet and bloom crops. 23.00 to 23.50
Cast iron borings. 12.75 to 13.25
Mixed bor. & turn. 12.75 to 13.25
No. 2 busheling. 12.00 to 12.50
No. 1 cast. 19.00 to 19.50
Railroad grate bars. 11.50 to 12.00
Stove plate. 11.00 to 11.50
Rails under 3 ft. 22.00 to 23.00
Rails for rollings. 20.00 to 20.50
Railroad malleable. 22.00 to 22.50
Cast iron carwheels. 21.00 to 21.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:
No. 1 hvy. mltng. steel. \$18.00 to \$18.50
No. 2 hvy. mltng. steel. 16.00 to 16.50
Scrap rails. 18.50 to 19.00
New hvy. b'dnd sheet. 16.00 to 16.50
Old hydraul. bundles. 15.00 to 15.50
Drop forge flashings. 16.00 to 16.50
No. 1 busheling. 16.00 to 16.50
Hvy. axle turnings. 13.50 to 14.00
Machine shop turn. 11.50 to 12.00
Knuckles & couplers. 20.50 to 21.00
Coll & leaf springs. 20.50 to 21.00
Rolled steel wheels. 20.50 to 21.00
Low phos. billet crops. 21.00 to 21.50
Shov. turnings. 13.00 to 13.50
Mixed bor. & turn. 11.50 to 12.00
Cast iron borings. 11.50 to 12.00
Steel car axles. 19.50 to 20.00
No. 1 machinery cast. 18.00 to 18.50
No. 1 cupola cast. 16.50 to 17.00
Stove plate. 15.00 to 15.50
Steel rails under 3 ft. 21.50 to 22.00
Cast iron carwheels. 15.50 to 16.00
Railroad malleable. 19.00 to 19.50
Chemical borings. 12.50 to 13.00

ST. LOUIS

Selected hvy. melting. \$16.50 to \$17.00
No. 1 hvy. melting. 18.50 to 17.00
No. 2 hvy. melting. 14.75 to 15.25
No. 1 locomotive tires. 19.00 to 19.50
Misc. stand.-sec. rails. 17.50 to 18.00
Railroad springs. 21.00 to 21.50
Bundled sheets. 11.50 to 12.00
No. 1 busheling. 11.50 to 12.00
Cast bor. & turn. 8.00 to 8.50
Rails for rollings. 19.00 to 19.50
Machine shop turn. 3.00 to 3.50
Heavy turnings. 13.50 to 14.00
Steel car axles. 23.00 to 23.50
Iron car axles. 24.00 to 24.50
No. 1 RR. wrought. 13.50 to 14.00
No. 2 RR. wrought. 16.50 to 17.00
Steel rails under 3 ft. 20.00 to 20.50
Steel angle bars. 18.00 to 18.50
Cast iron carwheels. 18.00 to 18.50
No. 1 machinery cast. 13.75 to 14.25
Railroad malleable. 17.50 to 18.00
No. 1 railroad cast. 13.25 to 14.25
Stove plate. 12.00 to 12.50
Agric. malleable. 12.50 to 13.00
Grate bars. 12.00 to 12.50
Brake shoes. 12.00 to 12.50

CINCINNATI

Dealers' buying prices per gross ton:
No. 1 hvy. mltng. steel. \$14.50 to \$15.00
No. 2 hvy. mltng. steel. 13.00 to 13.50
Hvy. breakable cast. 13.50 to 14.00
No. 1 machinery cast. 15.50 to 16.00
No. 2 cast. 13.50 to 14.00
Stove plate. 12.00 to 12.50
Steel car axles. 25.50 to 26.00
Shafting. 19.00 to 19.50
No. 1 RR. wrought. 16.00 to 16.50
No. 1 wrought long. 15.50 to 16.00
Spec. iron & steel pipe. 13.00 to 13.50
Rails for rolling. 18.50 to 19.00
Clean steel turnings. 9.25 to 9.75
Cast borings. 9.00 to 9.50
No. 1 blast furnace. 9.00 to 9.50
Cast borings (chem.). 12.50 to 13.00
Unprepar. yard scrap. 10.50 to 11.50
Per gross ton, delivered local foundries:
No. 1 machin. cast. \$17.50 to \$18.50
No. 1 hvy. cast cupola. 14.50 to 15.00
No. 2 cast. 14.00 to 14.50

BIRMINGHAM

Per gross ton delivered to consumer:
Hvy. melting steel. \$16.00 to \$16.50
Scrap steel rails. 17.00
Short shov. turnings. 8.50
Stove plate. 10.50
Steel axles. 18.00 to 19.00
Iron axles. 15.50 to 18.00
No. 1 RR. wrought. 13.00 to 15.00
Rails for rolling. 18.00 to 20.00
No. 1 cast. 16.00 to 18.00
Tramcar wheels. 16.00 to 18.00

DETROIT

Dealers' buying prices per gross ton:
on cars:
No. 1 hvy. mltng. steel. \$14.50 to \$15.00
No. 2 hvy. mltng. steel. 13.00 to 13.50
Hvy. breakable cast. 13.50 to 14.00
No. 1 machinery cast. 15.50 to 16.00
No. 2 cast. 13.50 to 14.00
Stove plate. 12.00 to 12.50
Steel car axles. 25.50 to 26.00
Shafting. 19.00 to 19.50
No. 1 RR. wrought. 16.00 to 16.50
No. 1 wrought long. 15.50 to 16.00
Spec. iron & steel pipe. 13.00 to 13.50
Rails for rolling. 18.50 to 19.00
Clean steel turnings. 9.25 to 9.75
Cast borings. 9.00 to 9.50
No. 1 blast furnace. 9.00 to 9.50
Cast borings (chem.). 12.50 to 13.00
Unprepar. yard scrap. 10.50 to 11.50
Per gross ton, delivered local foundries:
No. 1 machin. cast. \$17.50 to \$18.50
No. 1 hvy. cast cupola. 14.50 to 15.00
No. 2 cast. 14.00 to 14.50

BOSTON

Dealers' buying prices per gross ton:
No. 1 hvy. mltng. steel. \$14.80 to \$15.30
Scrap rails. 14.80 to 15.30
No. 2 steel. 13.50 to 14.30
Breakable cast. 13.00 to 13.50
Machine shop turn. 7.95
Mixed bor. & turn. 7.95
Bund. skeleton long. 11.25 to 11.50
Shafting. 18.00 to 18.25
Cast bor. chemical. 9.00 to 10.00
Per gross ton delivered consumers' yards:
Textile cast. \$18.00 to \$19.00
No. 1 machine cast. 18.00 to 19.00

PACIFIC COAST

Per gross ton delivered to consumer:
No. 1 hvy. mltng. steel. \$14.00 to \$15.00
No. 2 hvy. mltng. steel. 11.50

CANADA

Dealers' buying prices at their yards, per gross ton:
Toronto Montreal
No. 1 hvy. mltng. stl. \$14.50 \$14.00
No. 2 hvy. mltng. stl. 13.50 13.00
Mixed dealers steel. 12.50 12.00
Scrap pipe. 11.75 11.50
Steel turnings. 9.75 9.50
Cast borings. 11.00 10.50
Machinery cast. 18.00 17.00
Dealers cast. 16.00 15.00
Stove plate. 13.00 11.00

EXPORT

Dealers' buying prices per gross ton:

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PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Du'uth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton

Rerolling \$37.00
Forging quality 43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer \$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared 2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton

F.o.b. Pittsburgh or Cleveland \$47.00
F.o.b. Chicago, Youngstown or

Anderson, Ind. 48.00
F.o.b. Worcester, Mass. 49.00

F.o.b. Birmingham 50.00

F.o.b. San Francisco 56.00

F.o.b. Galveston 53.00

Rods over 9/32 in. to 47/64 in., in-

clusive, \$5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.

F.o.b. Pittsburgh 2.45c.

F.o.b. Chicago or Gary 2.50c.

F.o.b. Duluth 2.60c.

Del'd Detroit 2.60c.

F.o.b. Cleveland 2.50c.

F.o.b. Buffalo 2.55c.

Del'd Philadelphia 2.74c.

Del'd New York 2.78c.

F.o.b. Birmingham 2.60c.

F.o.b. cars dock Gulf ports 2.85c.

F.o.b. cars Pacific Ports 3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh 2.30c.

F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 2.35c.

F.o.b. Buffalo 2.10c.

F.o.b. Birmingham 2.45c.

F.o.b. cars dock Gulf ports 2.70c.

F.o.b. cars dock Pacific ports 2.85c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.55c.

F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary

or Birmingham 2.60c.

Del'd Detroit 2.70c.

F.o.b. cars dock Gulf ports 2.95c.

F.o.b. cars dock Pacific ports 2.95c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.40c.

F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary

or Birmingham 2.45c.

F.o.b. cars dock Gulf ports 2.80c.

F.o.b. cars dock Pacific ports 2.80c.

Iron

F.o.b. Chicago 2.40c.

F.o.b. Pittsburgh (refined) 3.60c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh 2.90c.

F.o.b. Cleveland, Chicago and

Gary 2.95c.

F.o.b. Buffalo 3.00c.

F.o.b. Detroit 2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.

F.o.b. Pittsburgh 2.25c.

F.o.b. Chicago or Gary 2.30c.

Del'd Cleveland 2.43c.

F.o.b. Coatesville or Spar. Pt. 2.35c.

Del'd Philadelphia 2.435c.

Del'd New York 2.53c.

F.o.b. Birmingham 2.40c.

Base per Lb.

F.o.b. cars dock Gulf ports 2.65c.
F.o.b. cars dock Pacific ports 2.80c.
Wrought iron plates, f.o.b. Pittsburgh 3.80c.

Floor Plates

F.o.b. Pittsburgh 3.50c.

F.o.b. Chicago 3.55c.

F.o.b. Coatesville 3.60c.

F.o.b. cars dock Gulf ports 3.90c.

F.o.b. cars dock Pacific ports 4.06c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh 2.25c.

F.o.b. Chicago 2.30c.

Del'd Cleveland 2.435c.

F.o.b. Buffalo or Bethlehem 2.35c.

Del'd Philadelphia 2.455c.

Del'd New York 2.5025c.

F.o.b. Birmingham (standard) 2.40c.

F.o.b. cars dock Gulf ports 2.65c.

F.o.b. cars dock Pacific ports 2.80c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh 2.60c.

F.o.b. Chicago or Buffalo 2.70c.

F.o.b. cars dock Gulf or Pacific Coast ports 3.05c.

Base per Lb.

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton \$42.50

Angle bars, per 100 lb. 2.80

Base per Lb.

F.o.b. Basing Points

Light rails (from billets) per gross ton \$43.00

Light rails (from rail steel) per gross ton 42.00

Base per Lb.

Spikes 3.15c.

Tie plates, steel 2.30c.

Tie plates, Pacific Coast ports 2.40c.

Track bolts, to steam railroads 4.35c.

Track bolts, to jobbers, all sizes (per 100 counts) 65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

Base per Box

Standard cokes, f.o.b. Pittsburgh district mill \$5.35

Standard cokes, f.o.b. Gary 5.45

Standard coke, f.o.b. Granite City 5.55

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Base per Box

F.o.b. Pittsburgh \$4.65

F.o.b. Gary 4.75

F.o.b. Granite City 4.85

No. 24, f.o.b. Birmingham 3.95c.
No. 24, f.o.b. cars, dock, Pacific ports 4.40c.
No. 24, wrought iron, Pittsburgh 6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.

Field grade 3.35c.

Armature 3.70c.

Electrical 4.20c.

Special Motor 5.10c.

Special Dynamo 5.80c.

Transformer 6.30c.

Transformer Special 7.30c.

Transformer Extra Special 7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 55c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh 4.10c.

F.o.b. Gary 4.20c.

F.o.b. cars, dock, Pacific ports 4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh 3.50c.

No. 20, f.o.b. Gary 3.60c.

No. 20, f.o.b. Granite City 3.70c.

No. 20, f.o.b. cars dock Pacific ports 4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb. 3.30c.

No. 28, Gary 3.40c.

No. 28, f.o.b. Granite City 3.50c.

No. 28, cars dock Pacific ports, boxed 4.175c.

Tin Plate

Base per Box

Standard cokes, f.o.b. Pittsburgh district mill \$5.35

Standard cokes, f.o.b. Gary 5.45

Standard coke, f.o.b. Granite City 5.55

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Base per Box

F.o.b. Pittsburgh \$4.65

F.o.b. Gary 4.75

F.o.b. Granite City 4.85

* Customer 1% per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C. \$12.00

15-lb. coating I.C. 14.00

20-lb. coating I.C. 15.00

25-lb. coating I.C. 16.00

30-lb. coating I.C. 17.25

40-lb. coating I.C. 19.50

Base per Lb.

Hot-Holed Hoops, Bands, Strip and

Flats under 1/4 in.

Base per Lb.

All widths up to 24 in., Pittsburgh 2.40c.

All widths up to 24 in., Chicago 2.50c.

All widths up to 24 in., del'd Detroit 2.60c.

All widths up to 24 in., Granite City 2.60c.

All widths up to 24 in., Birmingham 2.55c.

Cooperage stock, Pittsburgh 2.50c.

Cooperage stock, Chicago 2.60c.

Cold-Rolled Strip*

Base per Lb.

F.o.b. Pittsburgh 3.20c.

F.o.b. Cleveland 3.20c.

Del'd Chicago 3.48c.

F.o.b. Worcester 3.40c.

* Carbon 0.35 and less.

Cold-Rolled Spring Steel

Pittsburgh

and

Cleveland, Worcester

Carbon 0.25-0.50% 3.20c. 3.40c.

Carbon .51-.75 4.45c. 4.65c.

Carbon .76-1.00 6.30c. 6.50c.

Carbon Over 1.00 8.50c. 8.70c.

Fender Stock

No. 14, Pittsb'gh or Cleveland 3.45c.

No. 20, Pittsb'gh or Cleveland 3.85c.

WIRE PRODUCTS
(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

Per Lb.

Bright wire	2.90c.
Galvanized wire	2.95c.
Spring wire	3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.	

To the Trade

Base per Keg

Standard wire nails	\$2.75
Smooth coated nails	\$2.75
Cut nails, carloads	\$3.60

Base per 100 Lb.

Annealed fence wire	\$3.20
Galvanized fence wire	3.60
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column	74
Single loop bale ties, base col.	63
Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 over Pittsburgh.	

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills. F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

	Steel	Wrought Iron
In. Black Galv.	In. Black Galv.	
1/8	52	31
1/4 to 5/8	38 1/2	1/2 & 1/4 +13 +35
1/2	59 1/2	49
3/4	62 1/2	52
1 to 3	64 1/2	55 1/2

Lap Weld

2	57	47 1/2
2 1/2 & 3	60	50 1/2
3 1/2 to 6	62	52 1/2
7 & 8	61	50 1/2
9 & 10	60 1/2	50
11 & 12	59 1/2	49

Butt Weld, extra	strong, plain ends
1/8	50 1/2
1/4 to 5/8	52 1/2
1/2	57 1/2
3/4	61 1/2
1 to 3	63

Lap Weld, extra	strong, plain ends
2	55
2 1/2 & 3	59
3 1/2 to 6	62 1/2
7 & 8	61 1/2
9 & 10	60 1/2
11 & 12	59 1/2

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold	Hot
1 in. o.d.	12 R.W.G.	\$ 8.46
1 1/2 in. o.d.	12 R.W.G.	11.21
2 in. o.d.	12 R.W.G.	12.38
2 1/2 in. o.d.	12 R.W.G.	14.09
3 in. o.d.	12 R.W.G.	15.75
3 1/2 in. o.d.	12 R.W.G.	17.60
4 in. o.d.	12 R.W.G.	19.27
4 1/2 in. o.d.	12 R.W.G.	21.22
5 in. o.d.	12 R.W.G.	22.49
5 1/2 in. o.d.	12 R.W.G.	23.66
6 in. o.d.	12 R.W.G.	24.77
6 1/2 in. o.d.	12 R.W.G.	25.19
7 in. o.d.	12 R.W.G.	26.47
7 1/2 in. o.d.	12 R.W.G.	26.96
8 in. o.d.	12 R.W.G.	26.71
8 1/2 in. o.d.	12 R.W.G.	26.58
9 in. o.d.	12 R.W.G.	27.07
10 in. o.d.	12 R.W.G.	27.85
11 in. o.d.	12 R.W.G.	28.00
12 in. o.d.	12 R.W.G.	28.11
13 in. o.d.	12 R.W.G.	28.21
14 in. o.d.	12 R.W.G.	28.30
15 in. o.d.	12 R.W.G.	28.38
16 in. o.d.	12 R.W.G.	28.46
17 in. o.d.	12 R.W.G.	28.54
18 in. o.d.	12 R.W.G.	28.62
19 in. o.d.	12 R.W.G.	28.70
20 in. o.d.	12 R.W.G.	28.78
21 in. o.d.	12 R.W.G.	28.86
22 in. o.d.	12 R.W.G.	28.94
23 in. o.d.	12 R.W.G.	29.02
24 in. o.d.	12 R.W.G.	29.10
25 in. o.d.	12 R.W.G.	29.18
26 in. o.d.	12 R.W.G.	29.26
27 in. o.d.	12 R.W.G.	29.34
28 in. o.d.	12 R.W.G.	29.42
29 in. o.d.	12 R.W.G.	29.50
30 in. o.d.	12 R.W.G.	29.58
31 in. o.d.	12 R.W.G.	29.66
32 in. o.d.	12 R.W.G.	29.74
33 in. o.d.	12 R.W.G.	29.82
34 in. o.d.	12 R.W.G.	29.90
35 in. o.d.	12 R.W.G.	29.98
36 in. o.d.	12 R.W.G.	30.06
37 in. o.d.	12 R.W.G.	30.14
38 in. o.d.	12 R.W.G.	30.22
39 in. o.d.	12 R.W.G.	30.30
40 in. o.d.	12 R.W.G.	30.38
41 in. o.d.	12 R.W.G.	30.46
42 in. o.d.	12 R.W.G.	30.54
43 in. o.d.	12 R.W.G.	30.62
44 in. o.d.	12 R.W.G.	30.70
45 in. o.d.	12 R.W.G.	30.78
46 in. o.d.	12 R.W.G.	30.86
47 in. o.d.	12 R.W.G.	30.94
48 in. o.d.	12 R.W.G.	31.02
49 in. o.d.	12 R.W.G.	31.10
50 in. o.d.	12 R.W.G.	31.18
51 in. o.d.	12 R.W.G.	31.26
52 in. o.d.	12 R.W.G.	31.34
53 in. o.d.	12 R.W.G.	31.42
54 in. o.d.	12 R.W.G.	31.50
55 in. o.d.	12 R.W.G.	31.58
56 in. o.d.	12 R.W.G.	31.66
57 in. o.d.	12 R.W.G.	31.74
58 in. o.d.	12 R.W.G.	31.82
59 in. o.d.	12 R.W.G.	31.90
60 in. o.d.	12 R.W.G.	31.98
61 in. o.d.	12 R.W.G.	32.06
62 in. o.d.	12 R.W.G.	32.14
63 in. o.d.	12 R.W.G.	32.22
64 in. o.d.	12 R.W.G.	32.30
65 in. o.d.	12 R.W.G.	32.38
66 in. o.d.	12 R.W.G.	32.46
67 in. o.d.	12 R.W.G.	32.54
68 in. o.d.	12 R.W.G.	32.62
69 in. o.d.	12 R.W.G.	32.70
70 in. o.d.	12 R.W.G.	32.78
71 in. o.d.	12 R.W.G.	32.86
72 in. o.d.	12 R.W.G.	32.94
73 in. o.d.	12 R.W.G.	33.02
74 in. o.d.	12 R.W.G.	33.10
75 in. o.d.	12 R.W.G.	33.18
76 in. o.d.	12 R.W.G.	33.26
77 in. o.d.	12 R.W.G.	33.34
78 in. o.d.	12 R.W.G.	33.42
79 in. o.d.	12 R.W.G.	33.50
80 in. o.d.	12 R.W.G.	33.58
81 in. o.d.	12 R.W.G.	33.66
82 in. o.d.	12 R.W.G.	33.74
83 in. o.d.	12 R.W.G.	33.82
84 in. o.d.	12 R.W.G.	33.90
85 in. o.d.	12 R.W.G.	33.98
86 in. o.d.	12 R.W.G.	34.06
87 in. o.d.	12 R.W.G.	34.14
88 in. o.d.	12 R.W.G.	34.22
89 in. o.d.	12 R.W.G.	34.30
90 in. o.d.	12 R.W.G.	34.38
91 in. o.d.	12 R.W.G.	34.46
92 in. o.d.	12 R.W.G.	34.54
93 in. o.d.	12 R.W.G.	34.62
94 in. o.d.	12 R.W.G.	34.70
95 in. o.d.	12 R.W.G.	34.78
96 in. o.d.	12 R.W.G.	34.86
97 in. o.d.	12 R.W.G.	34.94
98 in. o.d.	12 R.W.G.	35.02
99 in. o.d.	12 R.W.G.	35.10
100 in. o.d.	12 R.W.G.	35.18
101 in. o.d.	12 R.W.G.	35.26
102 in. o.d.	12 R.W.G.	35.34
103 in. o.d.	12 R.W.G.	35.42
104 in. o.d.	12 R.W.G.	35.50
105 in. o.d.	12 R.W.G.	35.58
106 in. o.d.	12 R.W.G.	35.66
107 in. o.d.	12 R.W.G.	35.74
108 in. o.d.	12 R.W.G.	35.82
109 in. o.d.	12 R.W.G.	35.90
110 in. o.d.	12 R.W.G.	35.98
111 in. o.d.	12 R.W.G.	36.06
112 in. o.d.	12 R.W.G.	36.14
113 in. o.d.	12 R.W.G.	36.22
114 in. o.d.	12 R.W.G.	36.30
115 in. o.d.	12 R.W.G.	36.38
116 in. o.d.	12 R.W.G.	36.46
117 in. o.d.	12 R.W.G.	36.54
118 in. o.d.	12 R.W.G.	36.62
119 in. o.d.	12 R.W.G.	36.70
120 in. o.d.	12 R.W.G.	36.78
121 in. o.d.	12 R.W.G.	36.86
122 in. o.d.	12 R.W.G.	36.94
123 in. o.d.	12 R.W.G.	37.02
124 in. o.d.	12 R.W.G.	37.10
125 in. o.d.	12 R.W.G.	37.18
126 in. o.d.	12 R.W.G.	37.26
127 in. o.d.	12 R.W.G.	37.34
128 in. o.d.	12 R.W.G.	37.42
129 in. o.d.	12 R.W.G.	37.50
130 in. o.d.	12 R.W.G.	37.58
131 in. o.d.	12 R.W.G.	37.66
132 in. o.d.	12 R.W.G.	37.74
133 in. o.d.	12 R.W.G.	37.82
134 in. o.d.	12 R.W.G.	37.90
135 in. o.d.	12 R.W.G.	37.98
136 in. o.d.	12 R.W.G.	38.06
137 in. o.d.	12 R.W.G.	38.14
138 in. o.d.	12 R.W.G.	38.22
139 in. o.d.	12 R.W.G.	38.30
140 in. o.d.	12 R.W.G.	38.38
141 in. o.d.	12 R.W.G.	38.46
142 in. o.d.	12 R.W.G.	38.54
143 in. o.d.	12 R.W.G.	38.62
144 in. o.d.	12 R.W.G.	38.70
145 in. o.d.	12 R.W.G.	38.78
146 in. o.d.	12 R.W.G.	38.86
147 in. o.d.	12 R.W.G.	38.94
148 in. o.d.	12 R.W.G.	39.02
149 in. o.d.	12 R.W.G.	39.10
150 in. o.d.	12 R.W.G.	39.18
151 in. o.d.	12 R.W.G.	39.26
152 in. o.d.	12 R.W.G.	39.34
153 in. o.d.	12 R.W.G.	39.42
154 in. o.d.	12 R.W.G.	39.50
155 in. o.d.	12 R.W.G.	39.58
156 in. o.d.	12 R.W.G.	39.66
157 in. o.d.	12 R.W.G.	39.74
158 in. o.d.	12 R.W.G.	39.82
159 in. o.d.	12 R.W.G.	39.90
160 in. o.d.	12 R.W.G.	39.98
161 in. o.d.	12 R.W.G.	40.06
162 in. o.d.	12 R.W.G.	40.14
163 in. o.d.	12 R.W.G.	40.22
164 in. o.d.	12 R.W.G.	40.30
165 in. o.d.	12 R.W.G.	40.38
166 in. o.d.	12 R.W.G.	40.46
167 in. o.d.	12 R.W.G.	40.54
168 in. o.d.	12 R.W.G.	40.62
169 in. o.d.	12 R.W.G.	40.70
170 in. o.d.	12 R.W.G.	40.78
171 in. o.d.	12 R.W.G.	40.86
172 in. o.d.	12 R.W.G.	40.94
173 in. o.d.	12 R.W.G.	41.02
174 in. o.d.	12 R.W.G.	41.10
175 in. o.d.	12 R.W.G.	41.18
176 in. o.d.	12 R.W.G.	41.26
177 in. o.d.	12 R.W.G.	41.34
178 in. o.d.	12 R.W.G.	41.42
179 in. o.d.	12 R.W.G.	41.50
180 in. o.d.	12 R.W.G.	41.58
181 in. o.d.	12 R.W.G.	41.66
182 in. o.d.	12 R.W.G.	41.74
183 in. o.d.	12 R.W.G.	41.82
184 in. o.d.	12 R.W.G	

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

Per Net Ton	
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs 3.90c.
Per Cent Off List	
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'l'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

* Delivered in Pittsburgh switching district.

** Prices on application.

CHICAGO Base per Lb.

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	\$4.40
Track bolts (keg lots)	5.05
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
Per Cent Off List	
Machine bolts and carriage bolts, 1/2 in. and smaller	60
Lag screws	**55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, 1/2 by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring coppers	45
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c't'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

** Base at 100 lb.

NEW YORK

Base per Lb.	
Plates, 1/4 in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. char-coal	7.00 to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.
Hoops	4.32c.

IRON AND STEEL WAREHOUSE PRICES

Reinforc. steel bars	2.60c.
Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.80c.
Hot-rolled annealed sheets (No. 24)	4.86c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
Black ann'l'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
Per Cent Off List	
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	
1/2 in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

† Outside delivery 10c. less.
* For 5000 lb. or less.
† Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI

Base per Lb.

Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	4.25c.
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$3.48
Com. wire nails, base per keg: Any quantity less than carload. 3.20	
Cement c't'd nails, base 100-lb. keg	3.50
Chain, lin. per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes, 2-in.	20.73
4-in.	48.41

BUFFALO Base per Lb.

Plates	3.92c.
Floor plates	5.52c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in. 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	3.97c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per kg	\$3.26
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON

Base per Lb.

Channels, angles	4.20c.
Tees and zees, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, 1/4 in. thick and heavier	4.08c.
Floor plates, diamond pattern	5.13c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

CLEVELAND

Base per Lb.

Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.

DETROIT

Base per Lb.

Soft steel bars	3.49c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.
Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.	
* Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less 15c.	

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	5.16c.
Boiler rivets, cone head (keg lots)	5.26c.
Track spikes (keg lots)	4.81c.
Track bolts (keg lots)	5.81c.
Black annealed wire (No. 6 to No. 9 incl.)	4.95c.
Com. wire nails and cement coated nails 1 to 14 kegs	3.25c.

Per Cent Off List

Machine bolts and carriage bolts, $\frac{1}{4}$ x 6 and smaller or shorter	65
Larger and longer up to 1 in., diam.	60-5
$\frac{1}{4}$ in. and larger	60
Coach and lag screws	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.	60
200 lb. and over:	
$\frac{1}{4}$ in. and smaller	62 1/2
$\frac{9}{16}$ to 1 in.	60
$\frac{1}{2}$ in. and over	50

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 3999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates $\frac{1}{4}$ in. and heavier	5.50c.
Galvanized sheets, No. 24, 100 bds. or more	4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

PACIFIC COAST

Base per Lb.

	San Fran-	Los	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars..	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.35c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel			
Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	\$3.65	\$3.60	\$3.70

All items subject to differentials for quantity.

CHATTANOOGA

Base per Lb.

Mild steel bars	4.21c.
Iron bars	4.21c.
Reinforcing bars	4.21c.
Reinforcing shapes	4.11c.
Plates	4.11c.
Hot-rolled sheets No. 10	4.16c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.41c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.30c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	5.15c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	55

NEW ORLEANS

Base per Lb.

Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	\$3.55
Bolts and nuts, per cent off list	60

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester, Pa.	\$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash.	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered San Francisco, Los Angeles or Seattle	\$26.50
F.o.b. Birmingham	20.38

* Delivered prices on southern iron from shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	\$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.

Valley or Pittsburgh furnace \$23.50

Charcoal

Lake Superior furnace \$27.00
Delivered Chicago 30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sll. 2.25 to 2.75	\$26.50
No. 2 fdy., sll. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sll. 2.25 to 2.75	\$27.50
No. 2 fdy., sll. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) \$102.50

Spiegelisen

Per Gross Ton Furnace

Domestic, 19 to 21% \$23.00

F.o.b. New Orleans 33.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	\$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50
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For each additional 0.5% silicon up to 17%. 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	\$23.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally

\$1.80

Ferrotungsten, lots of 5000 lbs., nominally

1.85

Ferrotungsten, smaller lots, nominally

1.90

Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract

10.50c.

Ferrochromium, 2% carbon

16.50c. to 17.00c.

Ferrochromium, 1% carbon

17.50c. to 18.00c.

Ferrochromium, 0.10% carbon

19.50c. to 20.00c.

Ferrochromium, 0.06% carbon

20.00c. to 20.50c.

Ferrovanadium, del. per lb. contained V

\$2.70 to \$2.90

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.

\$2.50*

Ferrocobaltitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton

\$142.50

Ferrocobaltitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton

\$157.50

Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton

63.50

Ferrophosphorus, electric, 24%, in carloads, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.

80.00

Ferromolybdenum, per lb. Mo del.

95c.

Calcium molybdate, per lb. Mo del.

80c.

Silico spiegel, per ton, f.o.b. furnace, carloads

\$45.00

Ton lots or less, per ton, 50.00

Silico-manganese, gross ton, delivered.

101.50

2.50% carbon grade

106.50

2% carbon grade

111.50

1% carbon grade

121.50

* Spot prices are 25 a ton higher. Spot premium on 75 per cent ferrosilicon is \$10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50% \$5.25

Old range, non-Bessemer, 51.50% 5.10

Mesabi, Bessemer, 51.50% 5.10

Mesabi, non-Bessemer, 51.50% \$4.95
High phosphorus, 51.50% 4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal 17.00c.

Iron, low phos., Swedish, average, 58 1/2% iron, Nominal

Iron, basic or foundry, Swedish, aver., 65% iron, Nominal

Iron, basic or foundry, Russian, aver., 65% iron, Nominal

Man., Caucasian, washed 52%

Man., African, Indian, 44-48% Nominal

Man., African, Indian, 49-51% Nominal

Man., Brazilian, 46 to 48 1/2% Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered, nominal \$28.00 to \$30.00

Tungsten, domestic, scheelite delivered, nominally \$25.00 to \$29.00

Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade) \$16.00

Rhodesian, 45% 23.00

Rhodesian, 48% 26.75

Turkish, 48-49% 25.50 to 26.50

Turkish, 45-46% 23.50 to 24.00

Turkish, 44% 19.00 to 19.50

Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50% \$25.50 to \$26.50

48-49% 24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail \$20.00

Domestic, barge and rail, 85-5, f.o.b. Kentucky and Illinois mines \$22.00 to 23.00

Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid 24.50

Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines 35.00

COKE AND COAL

Coke

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt \$4.25 to \$4.50

Foundry, f.o.b. Connellsville, Prompt 5.00 to 6.25

Foundry, by-product, Chicago ovens 10.25

Foundry, by-product, del'd New England 12.50

Foundry, by-product, del'd Newark or Jersey City 10.85 to 11.30

Foundry, by-product, Philadelphia 10.60

Foundry, by-product, delivered Cleveland 11.00

Foundry, by-product, delivered Cincinnati 10.50

Foundry, by-product, del'd Birmingham 7.50

Foundry, by-product, del'd St. Louis industrial 11.00 to 11.50

Foundry, from Birmingham, f.o.b. cars docks, Pacific ports 14.75

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines \$1.50 to \$1.75

Mine run coking coal, f.o.b. W. Pa. 1.75 to 1.90

Gas coal, 1/2-in. f.o.b. Pa. mines 2.00 to 2.25

Mine run gas coal, f.o.b. Pa. mines 1.80 to 2.00

Steam slack, f.o.b. W. Pa. Pa. mines 1.00 to 1.25

Gas slack, f.o.b. W. Pa. mines 1.20 to 1.45

For
High Quality
STEELS

NIAGARA
BRAND
FERRO-ALLOYS

FERRO SILICON
ALL GRADES

FERRO CHROMIUM
HIGH CARBON

FERRO CHROMIUM
LOW CARBON

FERRO MANGANESE
SILICO MANGANESE

PITTSBURGH METALLURGICAL CO., Inc.

NIAGARA FALLS, N.Y.

Sales Offices: NEW YORK—30 Church St. • PITTSBURGH—Oliver Bldg. • CLEVELAND—Hanna Bldg.



FABRICATED STEEL

... Lettings advance to 18,115 tons from 11,210 tons last week.

... New projects in smaller volume at 9215 tons as against 24,300 tons in the previous week.

... Plate awards total 1775 tons.

NORTH ATLANTIC STATES

South Boston, 2250 tons, Edison station, to New England Structural Co., Everett, Mass.

Johnson, Vt., 105 tons, State bridge, to Vermont Structural Steel Co., Burlington, Vt.

Portsmouth, N. H., Navy Yard, 250 tons, for submarine construction, to Bethlehem Steel Co.

New York, 1990 tons, trestle, North Beach Airport, Riker's Island, to Bethlehem Steel Co.

New York, 410 tons, apartment building, 3-5 East 69th Street, to Ingalls Iron Works Co., Birmingham.

New York, 410 tons, apartment building, 4-8 East 70th Street, to Ingalls Iron Works Co.

New York, 560 tons, school No. 26 in Bronx, to Harris Structural Steel Co., Plainfield, N. J.

Elmhurst, L. I., 170 tons, Community building, to Belmont Iron Works, Philadelphia.

Ulster County, N. Y., 120 tons, State highway bridge, to American Bridge Co.

Buffalo, 110 tons, Morrison Steel Products Co., to R. S. McMannis Steel Construction Co., Buffalo.

Erie, Pa., 130 tons, machine shop extension, to Standard Stoker Co., to Rogers Structural Steel Co., Corry, Pa.

Scranton, Pa., 1310 tons, coal breaker for Glen Alden Coal Co., to Anthracite Bridge Co., Scranton, Pa.

Philadelphia, 4400 tons, court house, to Bethlehem Steel Co.

THE SOUTH

Lexington, Ky., 210 tons, biological science building, to Louisville Bridge & Iron Co., Louisville, Ky.

Holden, W. Va., 285 tons, coal tipple addition, to Gilbert Steel Co., Pittsburgh.

Brooks County, Ga., 200 tons, State overpass, to Bethlehem Steel Co.

Washington County, Ga., 400 tons, Balls Ferry bridge, to Nashville Bridge Co., Nashville, Tenn.

State of Oklahoma, 555 tons, bridges; Mayes County, 275 tons; Dewey County, 280 tons, both to Capitol Steel & Iron Co., Oklahoma City.

CENTRAL STATES

Detroit, 400 tons, State grade separation bridge, to Bethlehem Steel Co.

Detroit, 570 tons, Great Lakes Steel Corp., approach trestle for blast furnace, to R. C. Mahon Co., Detroit.

Detroit, 980 tons, Great Lakes Steel Corp.; blast furnace boiler house, 210 tons; blast furnace blower house, 120 tons; extension to cold finishing and shipping building, 650 tons, all to Whitehead & Kales Co., Detroit.

Rockford, Ill., 920 tons, manufacturing building, to Mississippi Valley Structural Steel Co., St. Louis.

Chicago, 140 tons, Wesley Memorial Hospital, to Joseph T. Ryerson & Son, Inc., Chicago.

Chicago, 340 tons, Glidden Co. building, to Bethlehem Steel Co.

Chicago, 400 tons, Pullman-Standard Car Mfg. Co. office building, to Hansell-Ecock Co., Chicago.

WESTERN STATES

Stockton, Cal., 500 tons, building for Continental Can Co., to Moore Dry Dock Co., San Francisco.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Cambridge, Mass., 400 tons, extension, Massachusetts Institute of Technology.

Brookline, Mass., 100 tons, high school.

New York, 2250 tons, Canal Street arch, West Side elevated highway; bids to be received by president, Borough of Manhattan.

WESTERN STATES

New York, 500 tons, changes, Steinway Tunnel line.

New York, 300 tons, warehouse for New York Central Railroad.

New York, 220 tons, New York Central Railroad viaduct.

Pittsburgh, 300 tons, power house, Pittsburgh & Lake Erie Railroad.

Upper Darby, Pa., 200 tons, store, F. W. Woolworth Co.

Bradford, Pa., 150 tons, highway bridge; bids Oct. 8.

Bucks County, Pa., 100 tons, highway bridge; bids Oct. 8.

THE SOUTH

Maysville, W. Va., 600 tons, coal tipple.

Leeds, Ala., 1500 tons, Universal Atlas Cement Co. building.

CENTRAL STATES

Detroit, 700 tons, John R. Street bridge; bids taken Sept. 29.

Clinton County, Ill., 750 tons, highway bridge; bids Oct. 1.

St. Louis, 140 tons, Marine Hospital; Foster & Creighton Co., Nashville, Tenn., low bidder on general contract.

WESTERN STATES

Denver, 520 tons, railroad underpass and approaches; bids Oct. 4.

Seattle, 625 tons, seaplane hangar.

FABRICATED PLATES

AWARDS

Portsmouth, N. H., Navy Yard, 1890 tons for submarine construction, to Lukens Steel Co., Coatesville, Pa.

Waterbury, Vt., 105 tons, steel pipe for War Department, to Taylor Forge & Pipe Works, Chicago.

Leetsdale, Pa., 280 tons, three sand barges, to Dravo Corp., Neville Island, Pittsburgh.

NEW PROJECTS

Baton Rouge, Miss., 500 tons, cofferdam, Mississippi River bridge.

San Francisco will open bids soon on 9400 lin. ft. of 60-in. for pipe line between Sunset Reservoir and 7th Avenue.

SHEET PILING

NEW PROJECTS

Philadelphia, 103 tons, bulkhead, U. S. Engineer's Office.

Queens, N. Y., 250 tons, storm sewers.

European Purchases of Scrap Here 750,000 Tons Since June

Since last June the European scrap cartel has purchased about 750,000 tons of steel and cast iron scrap in the United States, according to I. F. L. Elliott, director of the British Iron and Steel Federation and purchasing agent of the scrap cartel, who returned to England last week after a few weeks' stay in the United States and Canada.

While most of this scrap is for consumption in Great Britain, some will go to other countries that are members of the cartel, namely, Italy, Germany, Poland, Austria, Czechoslovakia, Rumania, Denmark and Sweden. France is not a member.

Although shipments of scrap are still going to Japan, these are against old orders, no recent business having been done.



THIS WEEK'S MACHINETOOL ACTIVITIES... .

... *Trend in demand has turned downward, except at Chicago.*

... *Press sales active, with equipment yet to be bought for huge Ford press shop.*

... *Russia continues to be chief factor in foreign business.*

Cleveland

WHILE some dealers are doing a fair volume of machine tool business, the trend in the demand in this territory appears to be slightly downward, and with the uncertainty of the industrial situation during the next few months, some prospects have been shifted to the inactive list. Considerable inquiry is pending for good used machinery. Lathe manufacturers report a little improvement in business over the first of the month.

Presses continue in good demand, considerable new equipment being purchased recently by refrigerator manufacturers and by makers of electrical appliances. A large amount of press equipment is expected to be required for the new press plant of the Ford Motor Co. and the Kelsey-Hayes Wheel Co. plant that is to be built in the Pittsburgh district. Inquiry for equipment for the former is not yet out. Punching and shearing machinery is slow.

Foreign inquiry continues active, and Russia is expected to place another large order in the next few days.

Cincinnati

MACHINERY demand in this area is quietly adhering to levels established the first part of the month. Ordering is fluctuating around 70 per cent of capacity, with various companies now above the level and then below. While Administration policies and war scares are being advanced for failure of the market to recover its full activity, manufacturers indicate current business is not discouraging. Of course, plant operation is unchanged, since backlog are sufficient to keep production at capacity well into the first quarter. Drilling machinery was more active the past week than heretofore, with reports of

several multiple unit upright orders. Inquiry remains active.

Detroit

THE heaviest buying reported in this area at the present time comes from Kelsey-Hayes Wheel Co., which is equipping a new plant in the Pittsburgh area. Buying continues also for the Ternstedt Mfg. Div. plant of General Motors in Trenton, N. J., and the Ford tire plant. Inquiries are light, and purchasing agents report that the completion of major automobile buying programs leaves them operating on a hand-to-mouth basis on most other purchases.

Chicago

ALL sellers report that September will be better than August, and state that inquiries now on hand indicate a continued upward trend in October. Buying is reported from some farm equipment manufacturers, but the railroads continue quiet. Carnegie-Illinois Steel Corp. has issued inquiries for a few tools. Little purchasing in other than small lots has been reported, and no additional price changes have been announced.

New York

NEW machinery orders are spotty. While some dealers report a lesser volume than for the like period in August, the majority are enjoying equal or somewhat better business. One dealer, after experiencing little activity, encountered a very active week, mostly miscellaneous small orders. A factory representative made his month's quota in orders received in two days. Both dealers and factory representatives agree, however, that inquiries are not holding up as well as they have been in recent weeks.

Heavy machinery is not in much demand, although a large volume of foreign business in recent weeks, principally from Russia, has built a substantial backlog for such suppliers. Railroad orders are absent, as well as inquiries. Some improvement in the delivery situation is noted, with the exception of large machinery which is being quoted for March and April delivery. Many smaller tools may be had in a month.

Pittsburgh

INQUIRIES are still fairly active, but show no material increase from the past few weeks. There is a tendency on the part of some customers to defer action on various projects with the result that orders are rather sluggish and are not quite up to recent levels. In the opinion of some dealers there does not appear to be any sound reason for the extreme caution being exercised; nevertheless machine tool buyers are rather "jittery" at the present time. Occasional price adjustments are being put through on some items.

"Armco" Honored By Butler, Pa.

BUTLER, Pa., recently observed "Armco Community Appreciation Day," a celebration praising the American Rolling Mill Co. and its officials for their contributions to the city's progress.

Five hundred representatives of Butler civic organizations attended a banquet at which George M. Verity, chairman of the company's board of directors, was honor guest. American Rolling Mill has been a large employer of labor in the Pennsylvania city for 10 years.

Structural Orders Decline In August

FABRICATED structural steel shipments during August dropped to 117,612 tons from 160,970 tons in July and were the lowest for any month in 1937 so far except February, the American Institute of Steel Construction reported.

August shipments, however, were highest for the year at 158,228 tons, compared with 142,709 in August, 1936, the institute said.

Shipments in August were 67.6 per cent of normal (the yearly average of 1928-1931 inclusive) against a 1937 monthly average of 57.9 per cent. Estimated total tonnage of fabricated structural steel contracts closed the first eight months of 1937 were 1,197,381 tons compared with shipments of 1,082,844 for the same period.



PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

National Can Co., 110 East Forty-second Street, New York, plans expansion and improvements in branch plants at Baltimore, Maspeth, L. I., Boston and Hamilton, Ohio, including equipment. Cost about \$550,000. Company is affiliated with McKeesport Tin Plate Corp., McKeesport, Pa., which is arranging financing through sale of preferred stock for this and other purposes.

John Simmons Co., 47-09 Thirtieth Street, Long Island City, New York, manufacturer of plumbing equipment, piping, etc., has filed plans for one-story machine shop, 200 x 311 ft. Cost close to \$100,000 with equipment. Roche & Roche, 358 West Forty-fourth Street, New York, are architects.

Linde Air Products Co., 30 East Forty-second Street, New York, has let general contract to Austin Co., Cleveland, for new two-story plant in Mifflin Township, Pa., near Pittsburgh. Cost over \$60,000 with equipment, tanks, etc.

Ruberoid Co., 500 Fifth Avenue, New York, manufacturer of roofing products, has acquired plant and business of Gold Seal Asphalt Roofing Co., Minneapolis, Minn. Plant will be expanded, with installation of additional equipment for production of roofing products of purchasing company.

Canada Dry Ginger Ale, Inc., 100 East Forty-second Street, New York, will take bids soon on general contract for new one-story and basement mechanical-bottling plant at Pittsburgh. Cost about \$100,000 with equipment.

American Cyanamid Co., 30 Rockefeller Plaza, New York, plans additions to branch plant at Bridgeville, Pa., known as Selden works, including new equipment. Cost over \$100,000 with machinery.

Board of Education, Glen Cove, L. I., plans installation of manual training equipment in new multi-story high school, for which bids will be asked soon on general contract. Cost about \$1,100,000. Financing has been arranged through Federal aid. Tooker & Marsh, 101 Park Avenue, New York, are architects.

American Cellulose & Chemical Mfg. Co., Ltd., 180 Madison Avenue, New York, affiliated with Celanese Corp. of America, Inc., same address, has approved plans for initial buildings for new cellulose rayon mill on about 1200 acre tract on New River in Giles County, Va., recently acquired, near Pearlsburg and Narrows, Va. It will include power house, machine shop and other mechanical departments. Cost about \$5,000,000. Later additional structures will be built, with total investment over three times sum noted. F. T. Small, located at company mill at Amcelle, near Cumberland, Md., is designing engineer.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until Oct. 4 for 2500 lb. of aluminum tubing (Circular 183); until Oct. 14, tap drills, convex cutters, hobs, machine taps, etc. (Circular 165), 5600 pieces of $\frac{1}{4}$ -in. seamless copper tubing, each piece 44-in. long (Circular 170), 45,000 lin. ft. of steel cable (Circular 167), 40 to 80 1000-lb. seamless tube bomb bodies (Circular 164); until Oct. 15, converting 13,400 lb. of aluminum alloy tubing, turnings and scrap into aluminum alloy rod (Circular 182); until Oct. 18, converting aluminum turnings, scrap and scrap bar alloy, etc., into 2500 lb. of aluminum strip (Circular 191), converting

3650 lb. of aluminum turnings into aluminum bar (Circular 192), re-working 63,000 lb. of zinc, brass, copper, bronze, wire, etc., into brass rods (Circular 190); until Oct. 18, one comparator gage, one micrometer and comparator, one light wave equipment and one set of gage blocks (Circular 195).

S. B. Penick & Co., 1819 Willow Avenue, Weehawken, N. J., manufacturer of industrial chemicals, etc., plans rebuilding two-story plant recently destroyed by fire. Loss over \$225,000 with equipment. A. C. Curran is plant superintendent.

Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies and kindred products, has let general contract to Wark & Co., 1608 Walnut Street, for one-story addition. Cost over \$80,000 with equipment.

Arctic Roofing Co., Wilmington, Del., Charles W. Bayliss, president, recently organized, has acquired property at Edge Moor, Del., adjoining factory of Krebs Pigment & Color Corp., for one-story plant totaling about 60,000 sq. ft. floor space, for which superstructure will begin soon. Cost over \$85,000 with equipment. Facilities will be provided for about 100 operatives.

Board of Education, Wilmington, Del., has let general contract to Turner Construction Co., Architects' Building, Philadelphia, for three-story T-shaped vocational school at Fourteenth and Market Streets, at \$328,650. Group of 12 shop units will be installed for foundry, machine shop, general metal-working, automobile mechanics and other industrial departments. Cost over \$500,000 with equipment. E. William Martin, duPont Building, is architect.

◀ BUFFALO DISTRICT ▶

Bliss & Laughlin, Inc., 110 Hopkins Street, Buffalo, manufacturer of steel shafting and other steel products, has taken out a permit for one-story addition. Cost over \$75,000 with equipment.

Rome Cable Corp., Rome, N. Y., manufacturer of insulated wire and cable, magnet wire, copper rods, etc., has plans for one-story addition. Cost close to \$50,000 with equipment.

United States Engineer Office, Federal Building, Buffalo, asks bids until Oct. 11 for one forged steel propeller tail shaft, machined and complete (Circular 37).

◀ NEW ENGLAND ▶

Great Northern Paper Co., Millinocket, Me., plans hydroelectric generating plant on main branch of Penobscot River, near Mattasunk, Me., with initial installation of hydraulic turbines and generator units for 18,000-hp. capacity. Transmission lines will be built from new station to mill site, where power substation will be located. Cost close to \$2,000,000.

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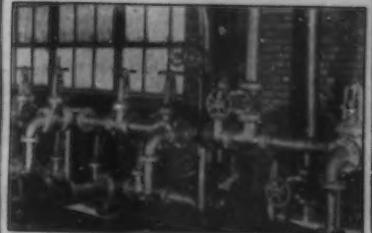
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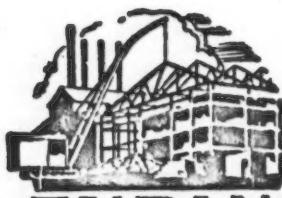


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PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

National Can Co., 110 East Forty-second Street, New York, plans expansion and improvements in branch plants at Baltimore, Maspeth, L. I., Boston and Hamilton, Ohio, including equipment. Cost about \$550,000. Company is affiliated with McKeesport Tin Plate Corp., McKeesport, Pa., which is arranging financing through sale of preferred stock for this and other purposes.

John Simmons Co., 47-09 Thirtieth Street, Long Island City, New York, manufacturer of plumbing equipment, piping, etc., has filed plans for one-story machine shop, 200 x 311 ft. Cost close to \$100,000 with equipment. Roche & Roche, 358 West Forty-fourth Street, New York, are architects.

Linde Air Products Co., 30 East Forty-second Street, New York, has let general contract to Austin Co., Cleveland, for new two-story plant in Millin Township, Pa., near Pittsburgh. Cost over \$60,000 with equipment, tanks, etc.

Hukoroid Co., 800 Fifth Avenue, New York, manufacturer of roofing products, has acquired plant and business of Gold Seal Asphalt Roofing Co., Minneapolis, Minn. Plant will be expanded, with installation of additional equipment for production of roofing products of purchased company.

Canada Dry Ginger Ale, Inc., 100 East Forty-second Street, New York, will take bids soon on general contract for new one-story and basement mechanical-bottling plant at Pittsburgh. Cost about \$100,000 with equipment.

American Cyanamid Co., 30 Rockefeller Plaza, New York, plans additions to branch plant at Bridgeville, Pa., known as Selden works, including new equipment. Cost over \$100,000 with machinery.

Board of Education, Glen Cove, L. I., plans installation of manual training equipment in new multi-story high school, for which bids will be asked soon on general contract. Cost about \$1,100,000. Financing has been arranged through Federal aid. Tooker & Marsh, 101 Park Avenue, New York, are architects.

American Cellulose & Chemical Mfg. Co., Ltd., 180 Madison Avenue, New York, affiliated with Celanese Corp. of America, Inc., same address, has approved plans for initial buildings for new cellulose rayon mill on about 1200 acre tract on New River in Giles County, Va., recently acquired, near Pearlsburg and Narrows, Va. It will include power house, machine shop and other mechanical departments. Cost about \$5,000,000. Later additional structures will be built, with total investment over three times sum noted. F. T. Small located at company mill at Amelle, near Cumberland, Md., is designing engineer.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until Oct. 4 for 2500 lb. of aluminum tubing (Circular 183); until Oct. 14, tap drills, convex cutters, hobs, machine taps, etc. (Circular 165), 5600 pieces of $\frac{1}{4}$ -in. seamless copper tubing, each piece 44-in. long (Circular 170), 45,000 lin. ft. of steel cable (Circular 167), 40 to 80 1000-lb. seamless tube bomb bodies (Circular 164); until Oct. 15, converting 13,400 lb. of aluminum alloy tubing, turnings and scrap into aluminum alloy rod (Circular 182); until Oct. 18, converting aluminum turnings, scrap and scrap bar alloy, etc., into 2500 lb. of aluminum strip (Circular 191), converting

3650 lb. of aluminum turnings into aluminum bar (Circular 192), re-working 63,000 lb. of zinc, brass, copper, bronze, wire, etc., into brass rods (Circular 190); until Oct. 18, one comparator gage, one micrometer and comparator, one light wave equipment and one set of gage blocks (Circular 195).

S. B. Penick & Co., 1819 Willow Avenue, Weehawken, N. J., manufacturer of industrial chemicals, etc., plans rebuilding two-story plant recently destroyed by fire. Loss over \$225,000 with equipment. A. C. Curran is plant superintendent.

Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies and kindred products, has let general contract to Wark & Co., 1608 Walnut Street, for one-story addition. Cost over \$80,000 with equipment.

Arctic Roofing Co., Wilmington, Del., Charles W. Bayliss, president, recently organized, has acquired property at Edge Moor, Del., adjoining factory of Krebs Paint & Color Corp., for one-story plant totaling about 60,000 sq. ft. floor space, for which superstructure will be 600 sq. ft. Cost over \$60,000 with equipment. Facilities will be provided for about 100 employees.

Board of Education, Wilmington, Del., has let general contract to Turner Construction Co., Architects' Building, Philadelphia, for three-story T-shaped vocational school at Fourteenth and Market Streets, at \$328,650. Group of 12 shop units will be installed for foundry, machine shop, general metal-working, automobile mechanics and other industrial departments. Cost over \$500,000 with equipment. E. William Martin, duPont Building, is architect.

◀ BUFFALO DISTRICT ▶

Bliss & Laughlin, Inc., 110 Hopkins Street, Buffalo, manufacturer of steel shafting and other steel products, has taken out a permit for one-story addition. Cost over \$75,000 with equipment.

Rome Cable Corp., Rome, N. Y., manufacturer of insulated wire and cable, magnet wire, copper rods, etc., has plans for one-story addition. Cost close to \$50,000 with equipment.

United States Engineer Office, Federal Building, Buffalo, asks bids until Oct. 11 for one forged steel propeller tail shaft, machined and complete (Circular 37).

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◀ WASHINGTON DIST. ▶

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for electric-generating plant at Ains Naval Reservation, Oahu, T. H., including gasoline engine-driven generator sets, switchboards, steel tanks and auxiliary equipment (Specifications 8531).

Owens-Illinois Can Co., Boston and Linwood Avenue, Baltimore, has plans for expansion and improvements, including additional equipment. Cost about \$100,000 with machinery. Francesco & Jacobus, 511 Fifth Avenue, New York, are architects and engineers. Company is a subsidiary of Owens-Illinois Glass Co., Toledo, Ohio.

General Purchasing Officer, Panama Canal, Washington, asks bids until Oct. 8 for 44,000 ft. of wire rope, 13,000 lb. of soft steel wire, steel rivets, copper pipe, brass pipe, turnbuckles, 3000 lb. of steel wire roofing nails, 46,000 lb. of common steel wire nails, copper wire cloth and other equipment (Schedule 3290).

Holttite Mfg. Co., Warner and Ostend Streets, Baltimore, manufacturer of solid rubber specialties, has let general contract to Talles Construction Co., 4024 Bonner Road, for one-story addition. Cost over \$35,000 with equipment. David Harrison, 421 St. Pat's Street, is architect.

Purchasing Officer, Department of Interior, Washington, asks bids until Oct. 4 for one road ripper for Lander, Wyo. (Proposal 2934); until Oct. 6, one electric arc welder for Charlotte Amalie, V. I. (Proposal 2932).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 5 for one motor-driven, light-duty radial drill (Schedule 1671), one motor-driven tool-room lathe, with universal relieving attachment (Schedule 1667), one motor-driven engine lathe (Schedule 1668), one hand-operated steel former and brake (Schedule 1669), one motor-driven universal grinding machine (Schedule 1666), one motor-driven core-making machine (Schedule 1688), 40 storage steel rotabins (Schedule 1670) for Eastern and Western Navy yards.

◀ WESTERN PA. DIST. ▶

Standard Gasket Co., Inc., 1701 Gaskell Avenue, Erie, Pa., has asked bids on general contract for one-story machine shop, 65 x 185 ft. Cost close to \$60,000 with equipment.

Kelly Creek Collieries Co., Morgantown, W. Va., plans improvements at Maiden coal-mining properties, including new combination tipple and coal-washing plant and auxiliary operating machinery. Cost over \$85,000.

Heckless Fastener Co., Inc., Meadville, Pa., manufacturer of metal fasteners, has plans for one-story addition, including improvements in present plant. Cost over \$100,000 with equipment.

◀ OHIO AND INDIANA ▶

John Harach Bronze & Foundry Co., 11612 Madison Avenue, Cleveland, has purchased former plant of Lakewood Engineering Co., 1202 Beres Road, Lakewood district, comprising two one-story units of 40,000 sq. ft. floor space, and will modernize for new plant, including erection of one-story addition, for which plans will be drawn by A. C. Wolf, Swetland Building, architect. Present plant will be removed to new location and additional equipment installed. Cost about \$60,000, of which close to one-half will be for new equipment. Company has disposed of present building to Cleveland Gasket & Mfg. Co., occupying an adjoining factory, which will take over for expansion.

Buckeye Bumpers, Inc., Jefferson and Ziegler Avenue, Springfield, Ohio, manufacturer of automobile bumpers and kindred automotive equipment, has asked bids on general contract for one-story addition. Cost over \$60,000 with equipment. Company is considering further extensions later. It is a subsidiary of Electric Auto-Lite Co., Toledo, Ohio.

Brewing Corp. of America, Inc., Quincy and East Ninety-third Streets, Cleveland,

has plans for two multi-story additions for a mechanical-bottling unit and as a fermentation department, respectively. Cost close to \$180,000 with equipment. Ernest McGeorge, 1900 Euclid Avenue, is architect and engineer.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Oct. 4 for 2250 8-in. dia. wire wheel brushes, and 2750 10-in. dia. similar brushes (Circular 211), four engine assembly stands (Circular 231); until Oct. 6, seamless steel tubing, chrome-molybdenum and corrosion-resistant chrome nickel (Circular 203); until Oct. 7, brass tubing, brass welding rods, brass wire, bronze castings, bronze wire, copper tubing, copper wire and copper brazing rods (Circular 206); until Oct. 15, three 11-ft. automatic levelers (Circular 217), spinner-propeller hubs (Circular 221), fuel pump assemblies (Circular 219).

Gatke Corp., Warsaw, Ind., manufacturer of brake lining, plastic products, etc., plans rebuilding part of plant recently destroyed by fire. Loss close to \$50,000 with equipment.

◀ MICHIGAN DISTRICT ▶

Briggs Mfg. Co., 11631 Mack Avenue, Detroit, steel automobile bodies, has purchased 74-acre tract on Eight-Mile Road, for new plant for production of automobile body parts, including rolled steel moldings and other sections. Cost close to \$2,500,000 with equipment. Completion is scheduled next spring. Company will use property on Connors Avenue, previously held by Hudson Motor Car Co., and recently acquired, for expansion in present Mack Avenue works, modernizing buildings, and removing certain departments to new location.

Motor Tool Mfg. Co., 12281 Turner Street, Detroit, has asked bids on general contract for one-story addition. Cost close to \$40,000 with equipment. R. H. Neubrech, Hofmann Building, is architect.

Ex-Cell-O Corp., 1200 Oakman Boulevard, Detroit, manufacturer of automatic screw machine products, aircraft engine parts, etc., has let general contract to Austin Co., Curtis Building, for one-story addition, primarily for storage and distribution. Cost close to \$35,000 with equipment.

Hayes Body Corp., Grand Rapids, Mich., has arranged for bond issue totaling \$700,000, considerable part of proceeds to be used for new plant unit and equipment.

◀ MIDDLE WEST ▶

Mechanics Universal Joint Co., Eighteenth Avenue, Rockford, Ill., manufacturer of automobile transmissions, universal joints, etc., has asked bids on general contract for one-story plant, 390 x 600 ft., with power house, 60 x 100 ft., at Harrison Avenue and Twentieth Street. Cost close to \$500,000 with equipment. Peterson & Johnson, Swedish-American Bank Building, are architects. Company is a division of Borg-Warner Corp., Chicago.

Glidden Co., 5165 West Moffat Street, Chicago, paints, varnishes, oils, etc., has let general contract to E. I. Leander, 228 North LaSalle Street, for two and three-story addition, 230 x 413 ft. Cost over \$200,000 with equipment. N. Ronneberg, Inc., 10 South LaSalle Street, is architect. Company headquarters are at Cleveland.

Division of Purchases and Sales, Department of Commerce, Washington, asks bids until Oct. 4 for construction of radio facilities at Denver, including steel towers, radio facility building, fuel tank, combination air filter and ventilator unit, corrugated iron culvert pipe, road metal and other equipment (Proposal 28801).

National Gypsum Co., Fort Dodge, Iowa, manufacturer of building products, etc., plans rebuilding part of mill recently destroyed by fire. Loss close to \$200,000 with equipment. Main offices are at Buffalo.

John Deere Tractor Co., Waterloo, Iowa, has let general contract to Jens Olsen & Sons Co., Sycamore Street, for one-story addition, 50 x 480 ft., primarily for storage and distribution. Cost over \$60,000 with equipment.

Sherman-Kline Co., 2581 West Forty-seventh Street, Chicago, manufacturer of screw machines, mechanics' hand tools, etc., has let general contract to Poirot Construction Co., 2001 West Pershing Road, for one-story addition, 135 x 400

ft. Cost about \$200,000 with equipment. A. Epstein, last noted address, is architect and engineer.

Falk Corp., Milwaukee, which recently purchased one unit, 114 x 308 ft., of old National Brake & Electric Co. group at Milwaukee, for reassembly as welding shop at its own plant, has purchased a second unit, 150 x 200 ft., for similar purposes. Both structures are to be ready for use by Dec. 1.

Milwaukee Gear Co., 3002 North Third Street, Milwaukee, has purchased former Otto Pletsch Dye Works building, 120 x 180 ft., one and two stories and basement, at bankruptcy sale for \$25,000 and will convert it into additional gear production space. With new equipment investment will be upward of \$50,000.

Waukesha Motor Co., Waukesha, Wis., has started work on factory addition, 35 x 360 ft., by roofing in court between main machine shops to store and handle material in various stages of processing. Equipment will include one-ton crane. Henry Harmon is company plant engineer.

Milwaukee Department of Public Works, City Hall, closes bids Oct. 8 for chemical feed equipment for new \$5,000,000 municipal water purification plant to cost \$75,000. Joseph P. Schwada is city engineer.

Spring City Foundry Co., Waukesha, Wis., has placed general contract with William F. Tubing Co., 8011 West Chestnut Street, Wauwatosa, Milwaukee, for core and pattern storage building, 55 x 75 ft., four stories and basement.

Signal Electric Mfg. Co., 1100 Broadway, Menominee, Mich., has plans by Derrick Hubert, local architect, for factory addition, 40 x 150 ft., two stories without basement, to cost \$50,000 with equipment.

◀ PACIFIC COAST ▶

Coast Centerless Grinding Co., 1049 East Slauson Avenue, Los Angeles, has let general contract to Hess Construction Co., Lynwood, Cal., for new one-story plant, 100 x 160 ft., with office and operating building, at McKinley and Slauson Avenue. Cost close to \$100,000 with equipment. W. M. Bostock, 6221 Pacific Boulevard, Huntington Park, Cal., is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 5 for 40 portable ventilating fans and spare parts for Mare Island Navy Yard (Schedule 1687); until Oct. 8, parts for airplanes for San Diego Naval Air Station (Schedule 900-1112).

Bureau of Reclamation, Denver, asks bids until Oct. 8 for one gasoline engine-driven generator unit and accessories for Imperial Dam and desilting works, All-American Canal System, Boulder Canyon project (Specifications 974-D).

Portland Chain Mfg. Co., 6630 North Burlington Street, Portland, has engaged J. W. DeYoung, 730 S.W. Salmon Street, architect, to prepare plans for new units, 70 x 150 ft., and 40 x 150 ft., on N.W. Front Avenue, Guild Lake Industrial District. Major part of last noted unit will be used as a forge shop. Bids will be asked on general contract in October. Cost over \$50,000 with equipment.

United States Engineer Office, Bonneville, Ore., asks bids until Oct. 6 for five vertical-type motor-driven sewage pumps, two automatic bilge pumps; one horizontal motor-driven sewage pump and one automatic bilge pump in another pumping station, all including switches, float controls, automatic controls, anchor bolts, valves, fittings, etc. (Circular 104).

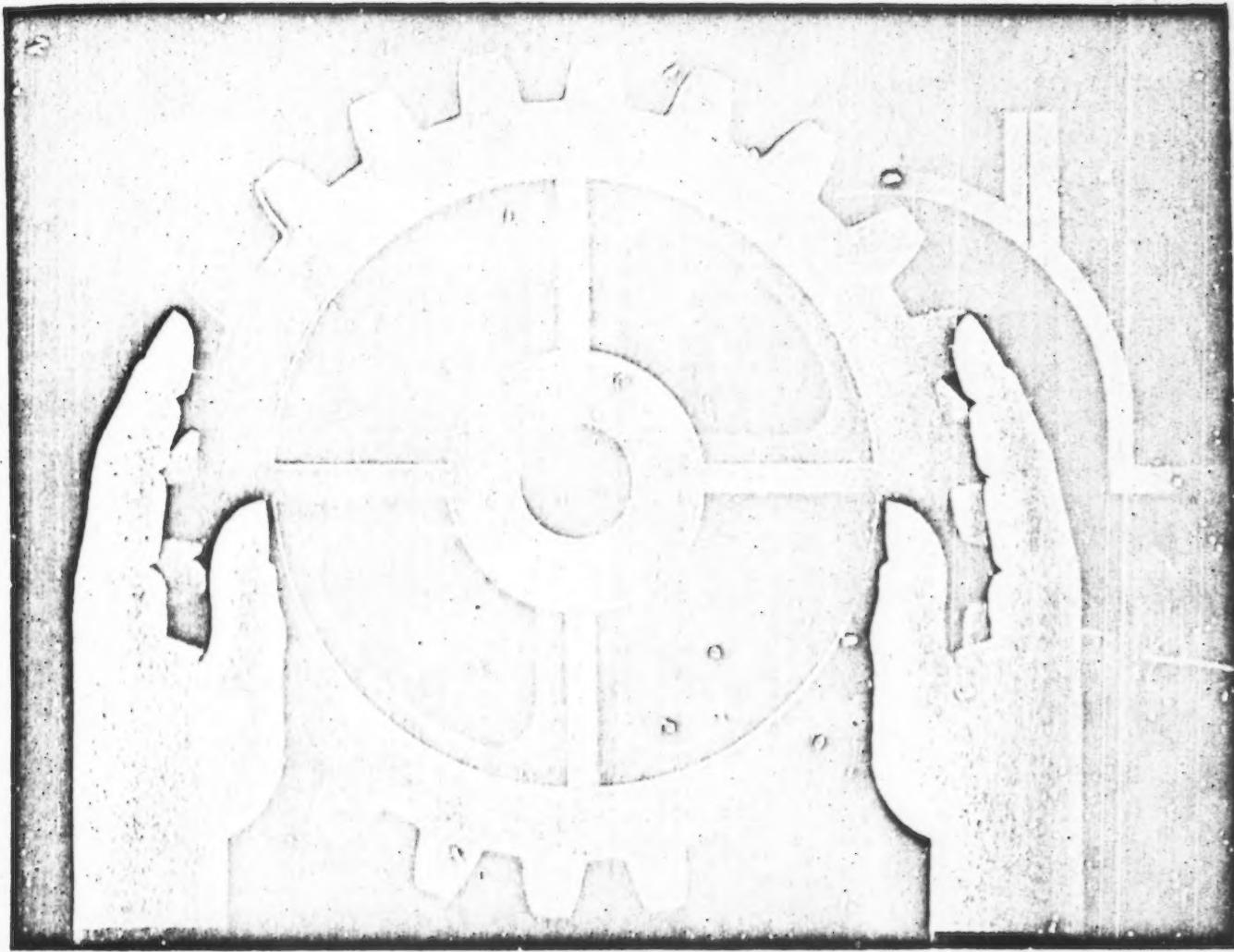
El Dorado Mines Co., Kingman, Ariz., has plans for new cyanide mill at mining plant near Kingman. Cost close to \$100,000 with machinery.

◀ FOREIGN ▶

Armstrong Siddeley Motors, Ltd., Coventry, England, manufacturer of automobiles and parts, has approved plans for one-story addition for increase in machine and assembling divisions, and one-story adjoining unit for storage and distribution. Cost over \$500,000 with equipment.

Department of Government Railways, Melbourne, Victoria, Australia, asks bids until Dec. 22 for two steam boilers for power house and accessory equipment.

Grav Forgings & Stampings, Ltd., 686 St. Clarens Avenue, Toronto, Ont., has approved plans for one-story addition, for which superstructure will begin at once. Cost close to \$40,000 with equipment.



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Parallel to the difficulty of putting square peg into round hole was the problem of a machinery manufacturer who needed a stronger gear, when space limitations prohibited making it larger.

A Manganese-Moly steel was used—and the problem was solved! . . . Without increase of size or weight, the needed strength was obtained.

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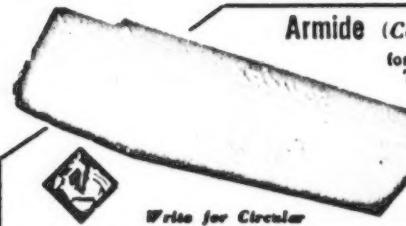
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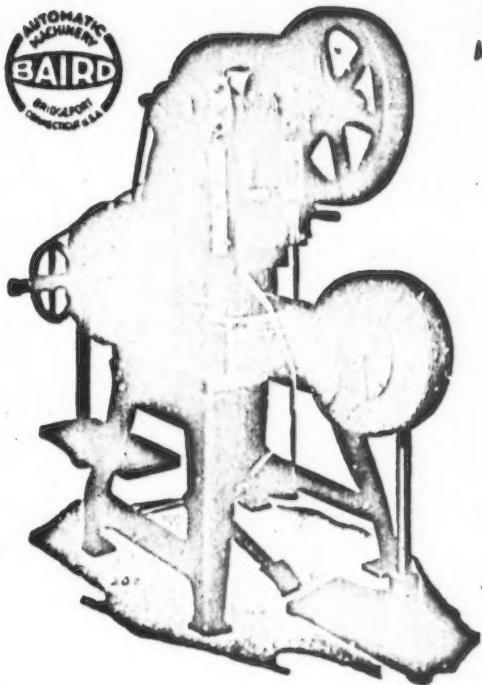
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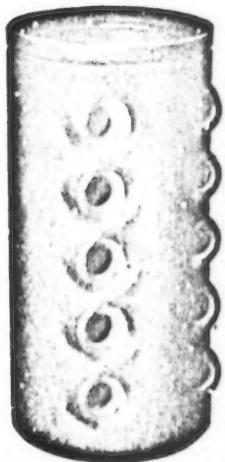
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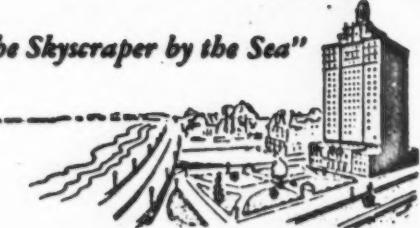
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Companies selling to the metal-working industry can maintain contact with these executives by advertising in the publication they prefer to read.

JUST BETWEEN US TWO

Jill of All Trades

IF that Russian Kay Francis really runs that blooming mill on page 39 of the Sept. 16 Iron Age, Oh for the life of a U.S.S.R. steelmaker!

But it seems to us we have seen her face before, operating res-
ters, cranes, looms, lathes and such, and we suspect she is simply
one of the Soviet photographic bureau's stock props. If we are
wrong, will Ralph Vaill, who wrote the article, tell us and we'll
be right over.

Vinegar and Gall Into Milk and Honey

BY a rare combination of carelessness and boneheadedness, plus a
dash of ingenuity, we succeeded in hitting a new high in sub-
scription mishandling on an address change sent us recently by a
Pennsylvania reader.

He followed up with a letter that seared our heart and spoiled
our morning. Always willing to make a frank acknowledgment
of errors we can't squirm out of, we apologized. He answered
graciously:

*"I am very much interested in all that Iron Age contains—in
fact it is a weekly encyclopedia of the industry. The absence
of it became more irritating every week and resulted in my
letter. Vaill's article is a 'pif."*

He Likes 'Em Mild

THE Oberleutnant, whose nostrils twitch like a scared stallion's
whenever a superlative rears its ugly head, has never yet been
able to look our slogan, "The World's Greatest Industrial Paper,"
smack in the eyes without flinching.

Despite the fact that we cautiously restrict to this sphere the
territory taken in, he thinks it is a bit on the blatant side. At the
risk of exciting a nose-dislocating twitch, we will show him a
slogan that makes our little jewel seem Woolworthy—the Writer's
Digest's "Leading, Largest and Foremost Writer's Magazine."
Make it "Leadingest" and it's perfect.

Upper Spine Caresser

BACKPAT from a New Jersey member of the big, happy family:

*"I am a constant reader and admirer of The Iron Age, finding
important information in it concerning my own work, and de-
veloping a broader view of the complete industrial field."*

Charley McCarthy Goes West

THE quaintest title we have ever run across appears on a reader
slip request from a New Mexico plant. After listing the
president, superintendent and other shop executives in conven-
tional manner, there follows the name of a gentleman whose title
is given as "Head Stooge."

And so we printed on the slips. If you want a year's supply
free, send us a list of your Iron Age readers, and we'll follow
copy to the last jot and title.

Fettling's Finale

THE last word on fettling is uttered by R. A. Williamson,
Eric, Pa.:

*"I suppose that every Englishman who reads your column has
told you that a fettler is a skilled chopper or dresser. In the
English shops of twenty-five years ago, a hammer and chisel
served as a substitute for a machine, and where a lot of stock
had to be chipped off, the fettler was it."*

*"How some of those fellows could chip, and with a little Al-
ing, leave a perfectly smooth finish! Of course, it would have
been preferable to change the pattern, but no one thought of
that."*

Low Cow-Efficient of Friction

UNDER-SKIN cow fat, cut in yard lengths, lubricates a
Vereeniging, Transvaal, rolling mill. Every so often a native
drapes a yard of it around the roll end adjacent to the neck bearing.
The resulting fragrance, we are told, makes a rendering
plant smell by comparison like *Christmas Night*.

Lost Chord

A FIRM'S name should harmonize with the product. Glutz, for
example, is an excellent name for a file manufacturer. Glutz
File Co. rasps soothingly on the ear, while Glutz would be no
name at all for a manufacturer of say perfume or panties.

Then, too, there's the matter of harmonizing the product with
the name of the town in which it is made. Consider the fore-
thought of The Rogers Rake Co. in situating itself in Pine Meadow,
Conn. And think how much more fitting it would have been
had the Carrier Air Conditioning people thought twice before
choosing Syracuse, N. Y., as their new home, and selected instead
Bon Air, Tenn.

—A.H.D.

